1946

ELECTRICAL REVIEW

FOUNDED 1872

CXXXVIII. No. 356 MARCH 29, 1946 9d. WEEKLY

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APR 16 1946
DETROIT

CABLE UNDER THE NILE

'THE width of the Nile at the point of crossing,' writes the Aberdare agent, 'is a little less than 600 yards . . . and the cables are now reposing peacefully enough in the soft silt of the river bed.' And so yet another Aberdare contract is completed, this time for the Société Egyptienne d'Électricité on its 11,000 volts 3 phase 50 cycles system to Giza and Mina. Aberdare Cable is once again beginning to wind its way through all countries where reconstruction and rehabilitation are of primary importance.

★ ★ ★

Independent specialists in paper-insulated cables. Manufacturers also of P.B.J. Cables, Hard and Soft Drawn Copper Wire, and Strand.

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THERE HE STANDS—symbol of authority in an orderly World — controlling — directing — obeyed because absolutely trustworthy and reliable.

What a fitting comparison with BIRCH RESISTANCES, *Arms of the Ohm's Law.*

Backed by many years of practical experience in which their reliability has been tested under all conditions, BIRCH RESISTANCES, in their various applications stand up to their job and can always be depended upon to provide specified service because of their first-class workmanship.

Birch

Please call upon us to help you solve any Resistance problem.

Resistances

ARMS OF THE OHM'S LAW

May we quote you for any of the following:—

DIMMERS — REGULATORS (Field, Shunt, Voltage) — RESISTANCES (Arc Lamp, Charging, Regulating, Sliding) — RHEOSTATS — ELEMENTS and SPIRALS.
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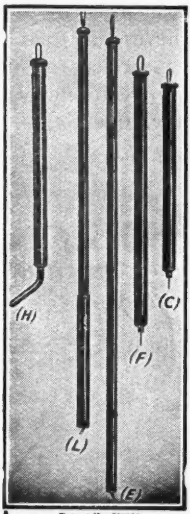
But Heatrae looks forward to the time when their waiting room will be less and less crowded, and, finally to the day when it is abolished for ever.

HEATRAE

leaders in electric water heaters

HEATRAE LTD. NORWICH . PHONE : NORWICH 25131 GRAMS : HEATRAE, NORWICH



Patent No. 619019

IS IT ALIVE?

THE "PARTRIDGE" PRESSURE DETECTOR

(Regd. T.M. No. B.581955)
will infallibly tell you, giving visible and audible indication
(No earth connection required)

Type	Range up to	Length of handle
C	Volts 11,000	36"
E	60,000	84"
F	15,000	48"
H	11,000	36"
L	33,000	72"

Also makers of "Westminster" Vacuum Tube Detector and H.T. Earthing Rods

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for so little attention!

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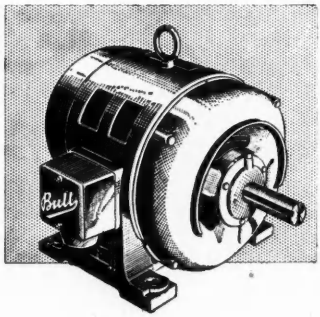

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Bull

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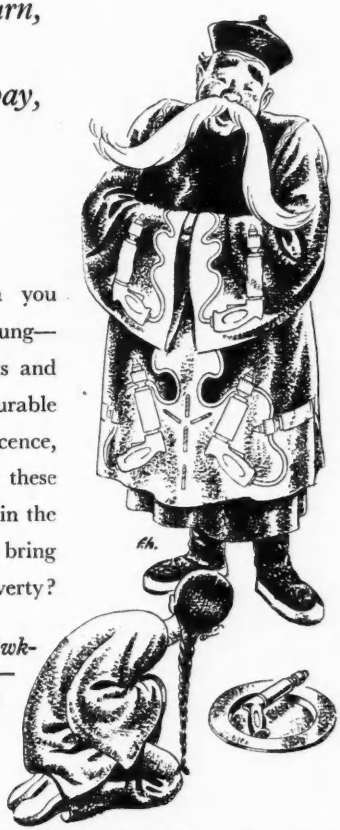
The more I cobble,
the less I earn,
For the soles ne'er crack,
nor the uppers turn,
The better my work,
the less my pay,
But work can only be
done . . . . o-o-one . . . .
wa - a - a - a - a - ay!



THE honourable poverty to which you refer—said the odious youth Tin Lung—shows clearly in your mean garments and the depressing flatness of your honourable stomach. But why then, Magnificence, continued the youth, do you make these announcements at your own expense in the public news sheets, since they can only bring you additional work and so increased poverty?

Pure benevolence, O Asker of Awkward Questions, Pure benevolence—replied His Magnificence with an acid smile.

DESOUTTER

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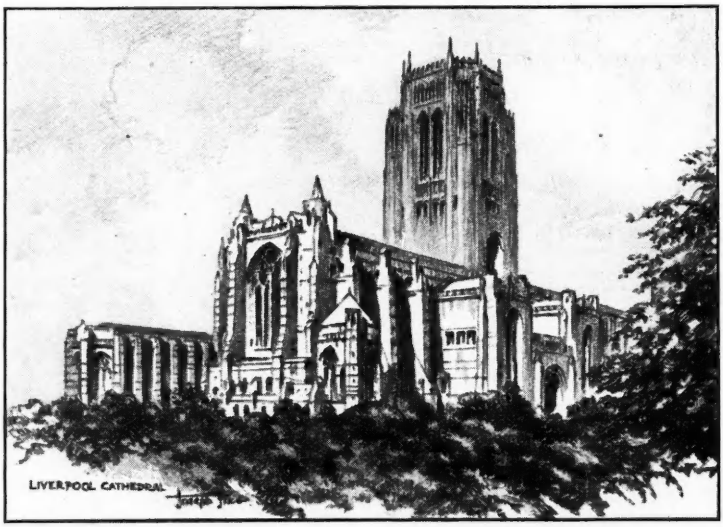
Telephone : Colindale 6346-7-8-9. Telegrams : Despnuco, Hyde, London.

C.R.C. 157

Landmarks of Britain



Liverpool LIVERPOOL CATHEDRAL

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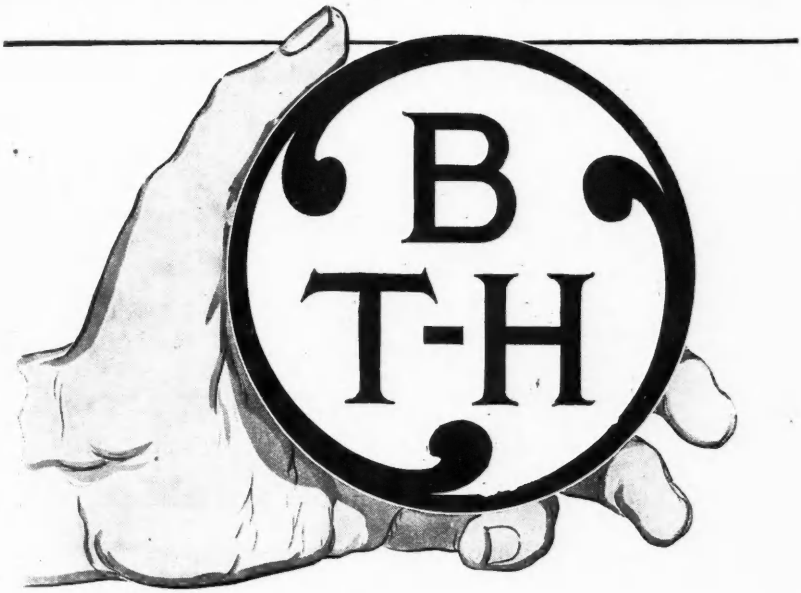

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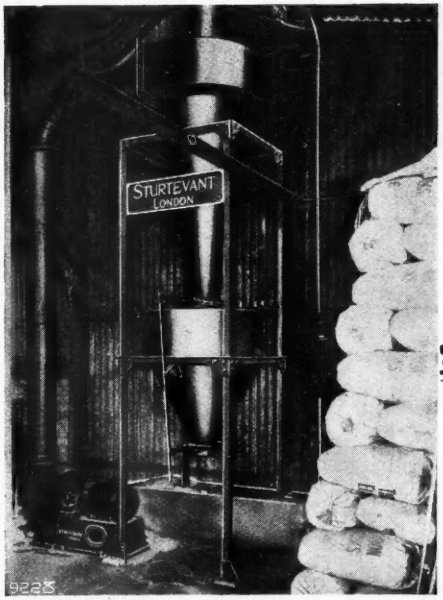
and at Manchester, Bristol, Glasgow and Dublin



Sturtevant T.L. Cyclone on a rotary dryer

The Sturtevant T.L. Cyclone Dust Collector solves many Industrial Dust Problems

- **The salvage of processing losses**
- **Collecting the dust caused in machining processes or material handling plant**
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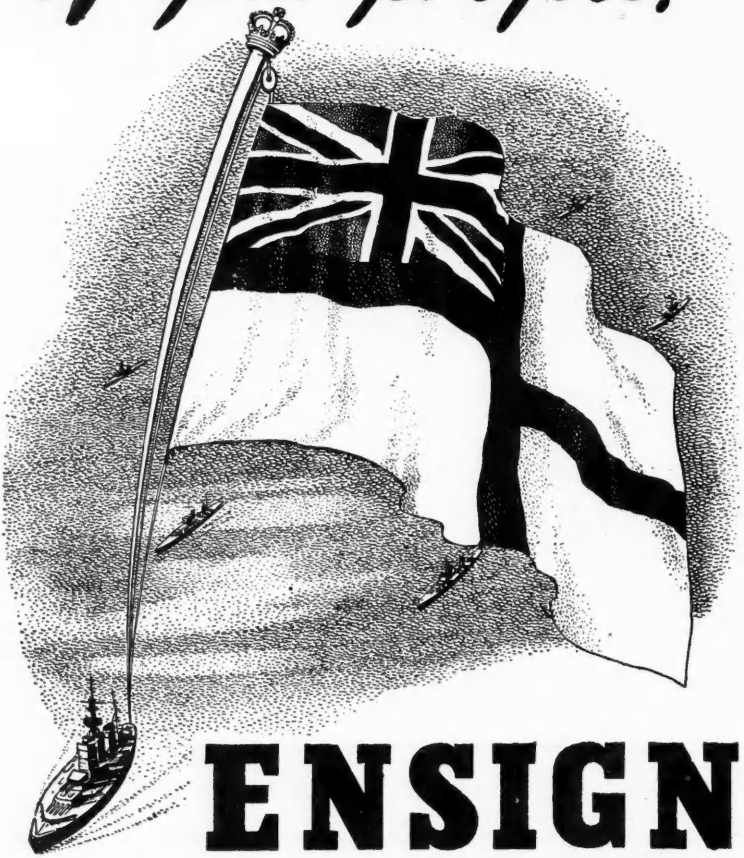

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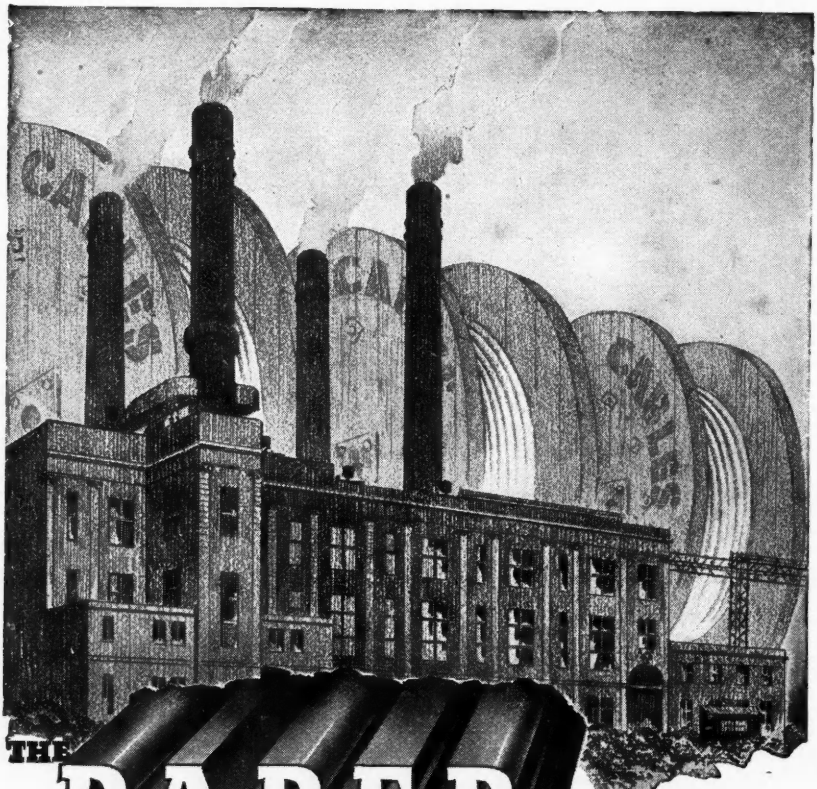

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BEHIND THE
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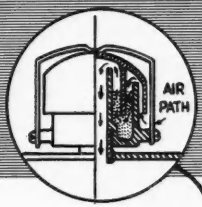
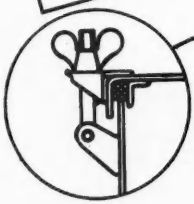
HOW FERRANTI TRANSFORMERS REDUCE MAINTENANCE COSTS

EXAMPLE 2

Quick Routine Inspection



Oil Sealed Breather Vent



Quick release and weatherproof features of Tank Cover.

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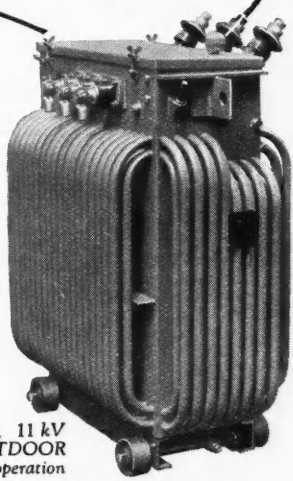

A typical 300 kVA, 11 kV Transformer for OUTDOOR operation

Specify **FERRANTI** *Transformers*

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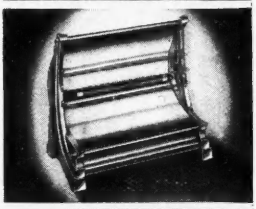

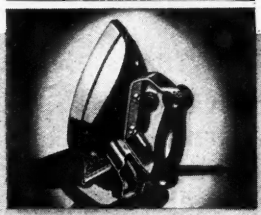

-and so are

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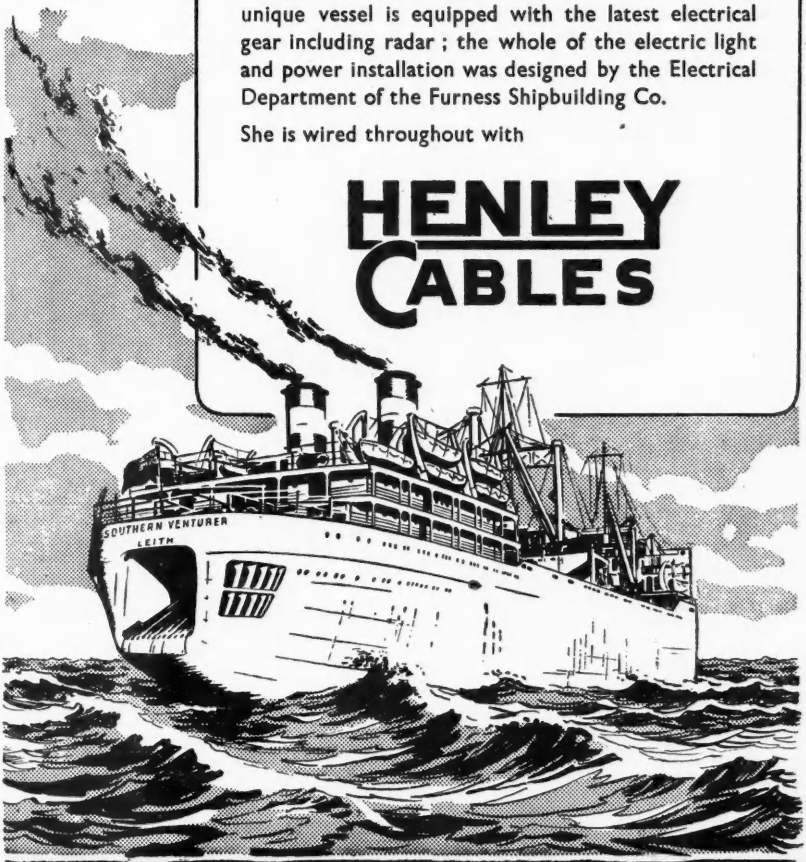
She is wired throughout with

HENLEY CABLES



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51-53 HATTON GARDEN, LONDON, E·C·1
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GRAMS: HENLETEL, SMITH, LONDON

This valve represents one of the most important developments in valve practice for the conditions of modern steam services. It embodies new features of design and construction which have an important influence on maintained steam tightness, elimination of pressure and temperature distortion, elimination of wire drawing, and reduction of pressure drop—advantages which have been thoroughly demonstrated by prolonged duty under the widest range of operating conditions, up to the most severe in use. The valve is available in globe, junction, and inclined forms, in cast iron, cast steel, forged steel, and bronze, and in manual or power operated versions as required. Those illustrated here are 14″ cast steel inclined pattern, with gearing and internal by-pass, for 655 lbs. per sq. in. at 835° F total temperature, and were supplied to Messrs. Stewarts and Lloyds Ltd. for Congella Power Station, of the Electricity Supply Co., South Africa. Full details from **J. Blakeborough and Sons, Ltd.,** Brighouse, England.

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Housing Priority!

Comply with B.S.S. No. 37-1937

Approved by the Electricity Commissioners

We can give Immediate Delivery of

SIEMENS

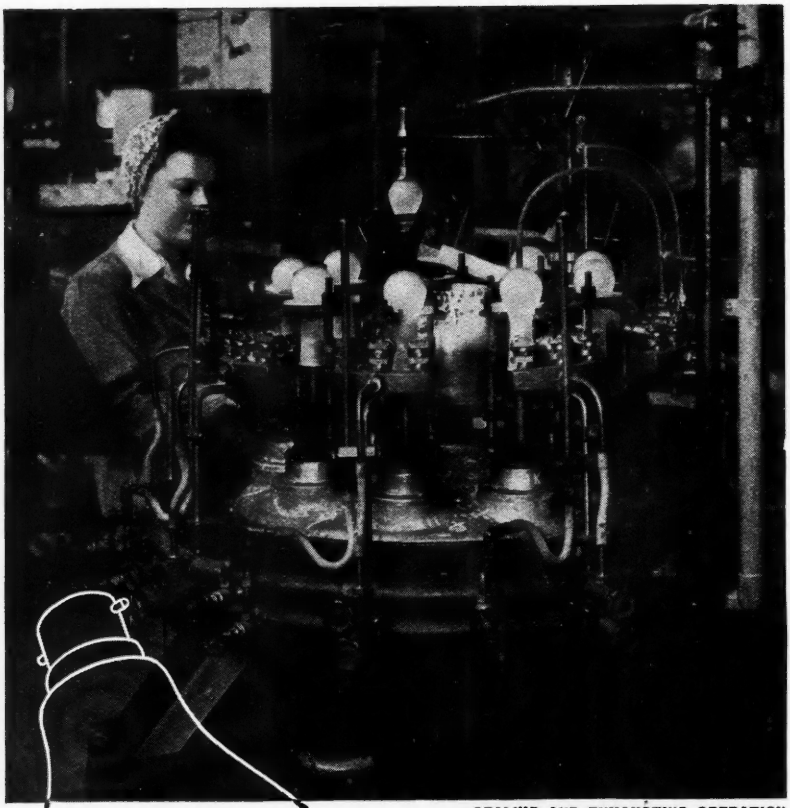
SINGLE PHASE ALL INSULATED

HOUSE SERVICE METERS

TYPE 21

SIEMENS ELECTRIC LAMPS & SUPPLIES LTD., 38/39 UPPER THAMES STREET, LONDON, E.C.4

Branches at Belfast, Birmingham, Bristol, Cardiff, Dublin, Glasgow, Leeds, Liverpool, Manchester, Newcastle-on-Tyne, Nottingham, Sheffield.



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Care and precision characterise this particular operation. The same care and precision is shown at every manufacturing stage of Royal "Ediswan" Lamps.

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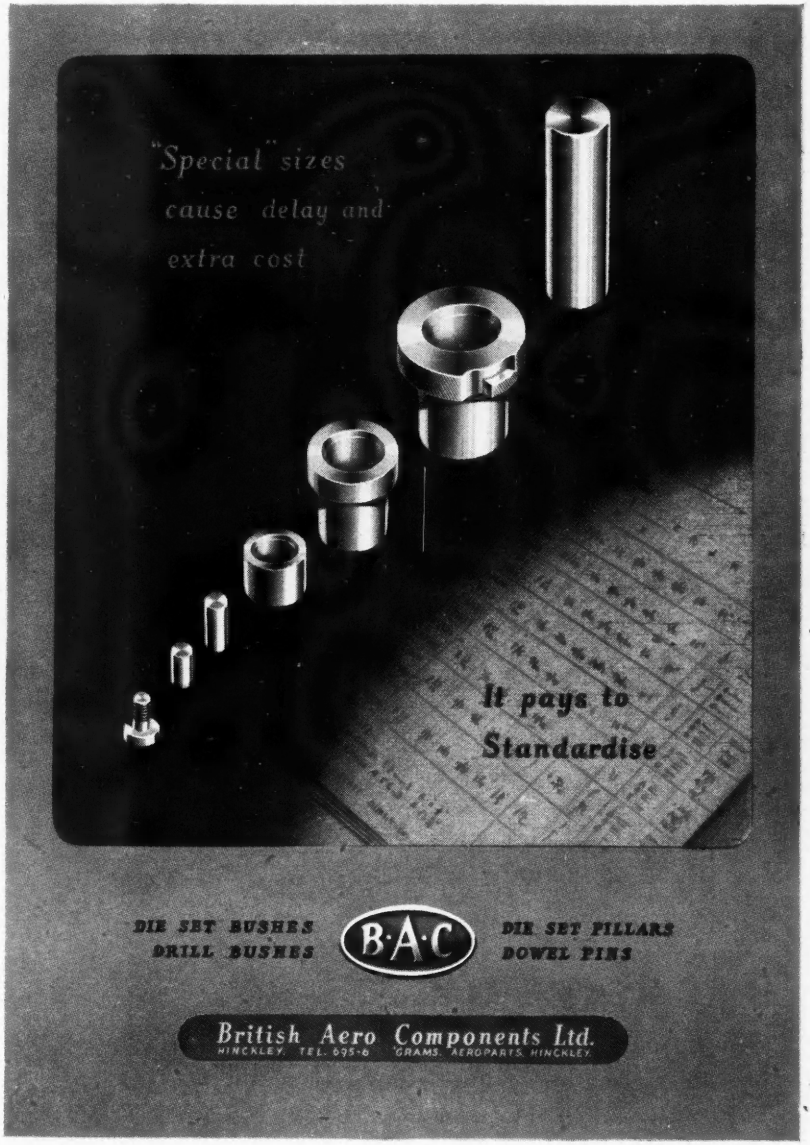

The B.A.C. Catalogue of Standardised Drill Bushes should be at hand in every Jig and Tool D.O. A varnished chart for wall display is also available on application (2½d. stamp).
BRITISH AERO COMPONENTS LTD., HINCKLEY, ENGLAND
Cogent B.103

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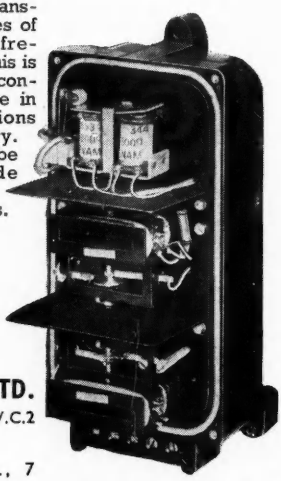
The restoration of full lighting facilities and the consequent need in many cases for provision of new material makes the present time opportune for the introduction of Rythmatic Control Equipment. The result will be streets well lighted by lamps controlled simply, efficiently, economically, from one pre-arranged convenient point.

Rythmatic Control Equipment operates through the super-imposition of a high-frequency current over the supply circuit initiated by a 'Master Switch' and transmitted as beat impulses of both pre-arranged frequency and rhythm. This is the modern method of control, proved in service in numerous installations throughout the country. The equipment can be extended to include the control of water-load and other facilities.



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AUTOMATIC TELEPHONE & ELECTRIC CO. LTD.

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SPEED-REDUCTION-UNIT

Brook Motors

USES

A means of transmitting power at reduced speed from a high speed, high efficiency induction motor.

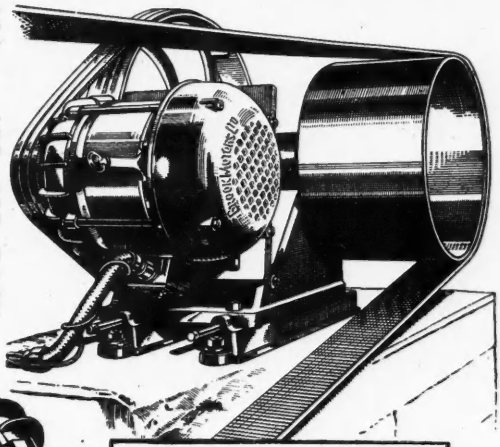
The following speeds can be obtained on the counter shaft, 350, 240, 170 or 140 r.p.m., depending on the motor speed, and, by using a suitable driving pulley, a final speed as low as 50 r.p.m. can be obtained.

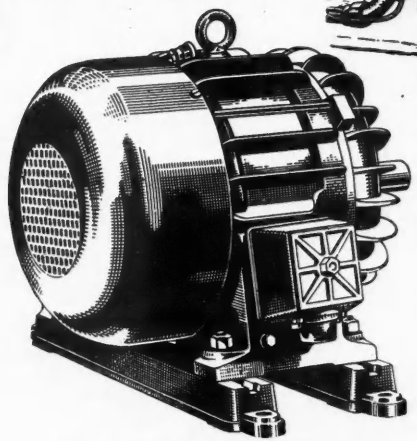
PRINCIPLE

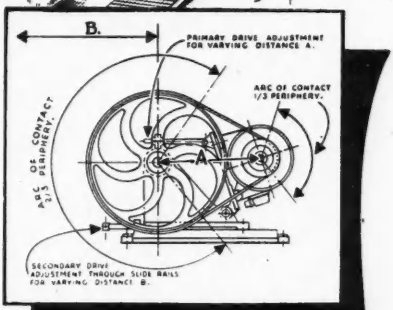
Belt contact on the driving pulley is approximately one-third the periphery, a vee pulley being used so that the belts can grip on both sides of the Vee.

The driven pulley (see Fig. A) has a belt contact of two-thirds of its periphery and gives a firm grip without grooves, resulting in lightness and economy.

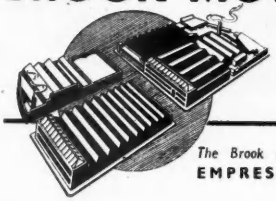
Provision is made for adjusting primary and secondary drives independently. Initial stretch of the belts can be taken up without interfering with the secondary drive, the latter being adjusted through tightening screws on the slide rail.






B.
PRIMARY DRIVE ADJUSTMENT FOR VARYING DISTANCE A.
ARC OF CONTACT 1/3 PERIPHERY.
ARC OF CONTACT 2/3 PERIPHERY.
A
SECONDARY DRIVE ADJUSTMENT THROUGH SLIDE RAILS FOR VARYING DISTANCE B.

BROOK MOTORS LTD • Huddersfield



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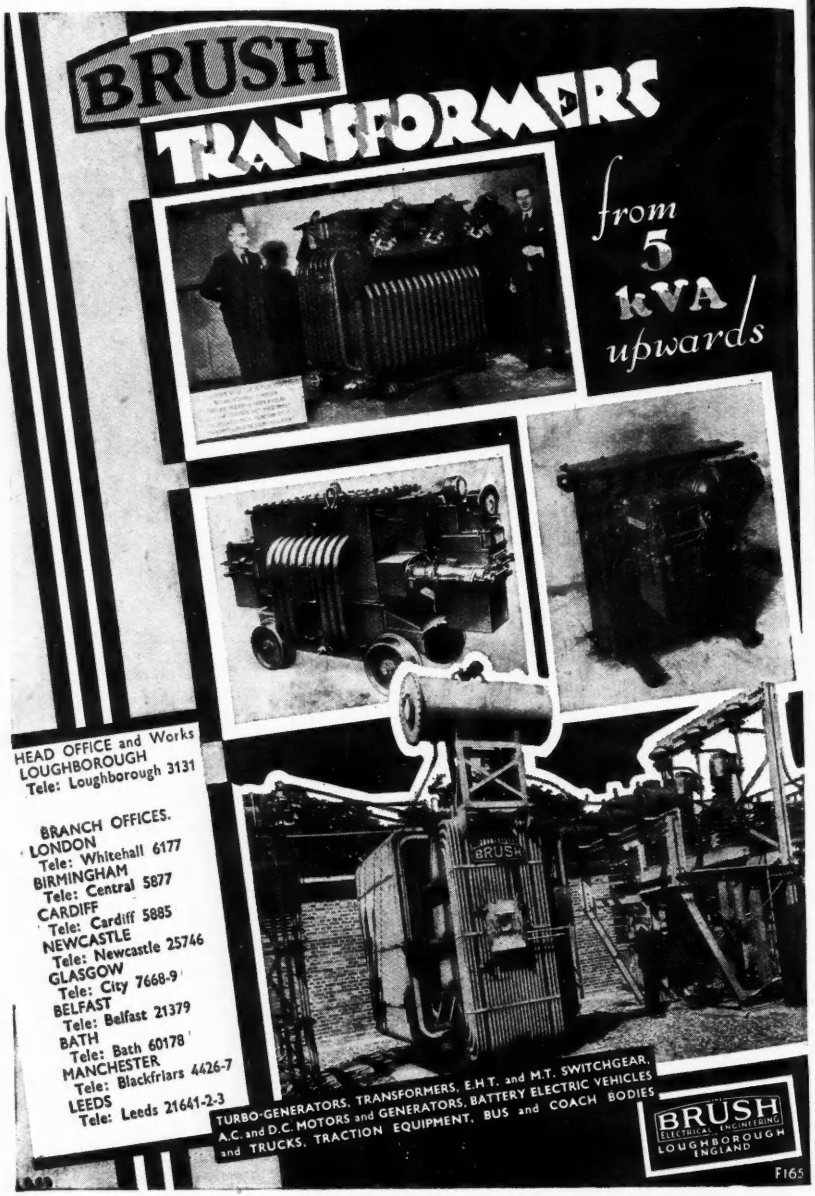
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F165

In support of

THE MINISTRY OF FOOD

here is another Recipe

for your Demonstrations

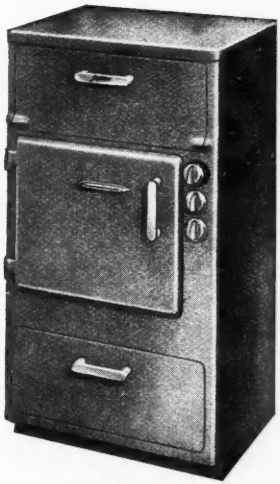
The Jackson Cooking Cabinet

Stuffed Herrings

Ingredients

2 boned herrings.
1 oz. fine oatmeal
1 oz. breadcrumbs
¼ teaspoonful mixed herbs
1 oz. suet
½ teaspoonful chopped parsley
Seasoning
Milk to mix or egg if available

} Stuffing



Cat. No. 192. J.

Method

Bind all the ingredients for the stuffing with the milk or egg. Open out the boned herrings and lay the stuffing on the top. Cover with another herring. Place in a glass or oven tin, cover with greased paper. Bake at 425°F. for 30 minutes.

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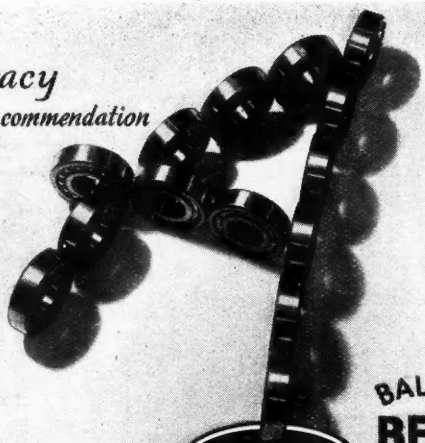

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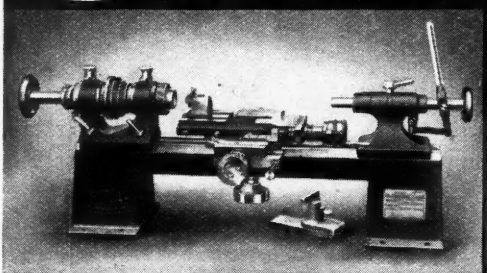

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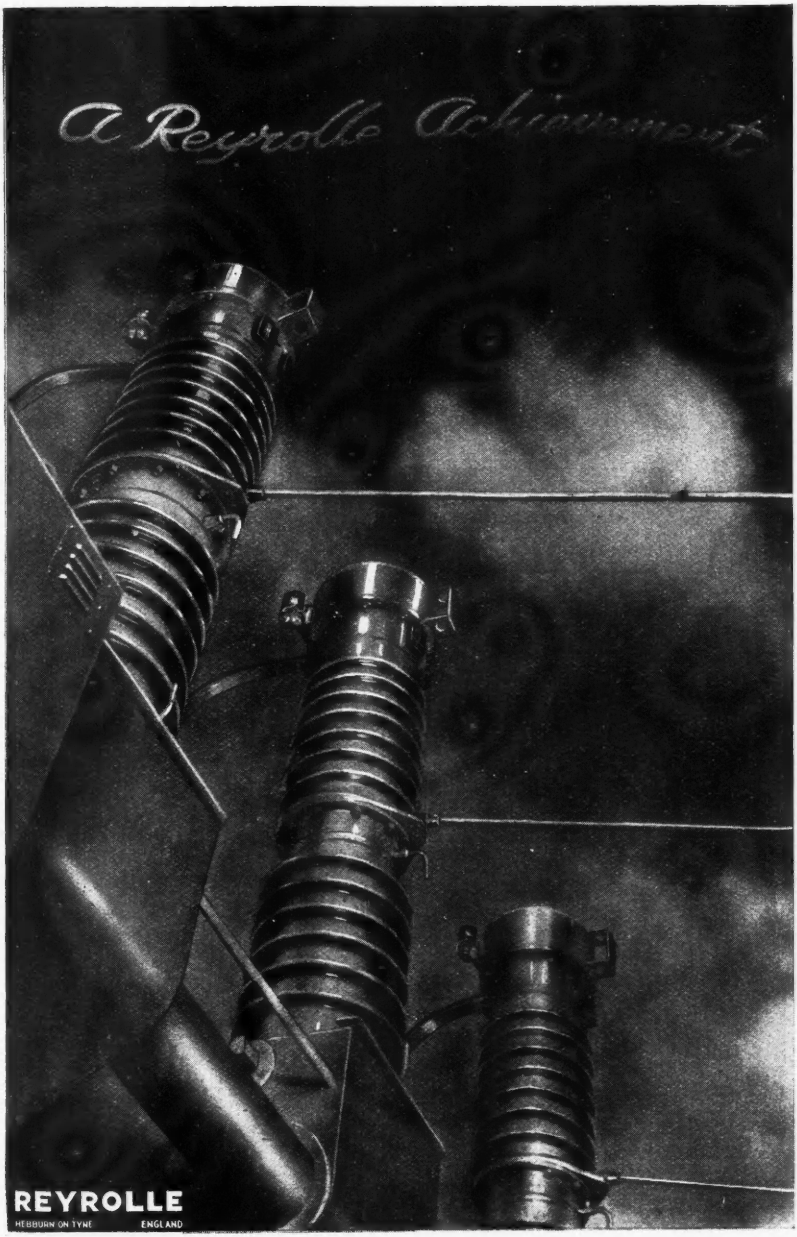
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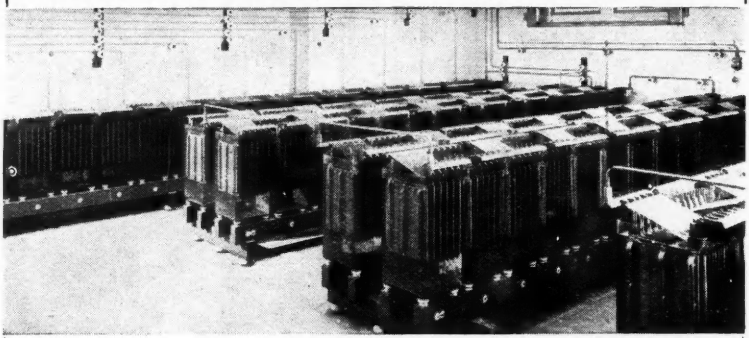

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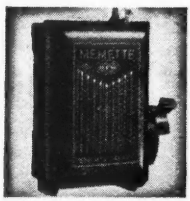

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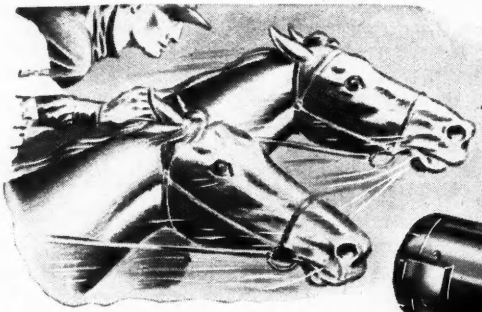

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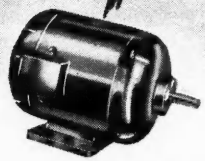

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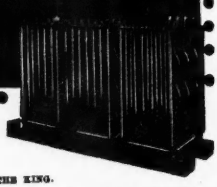

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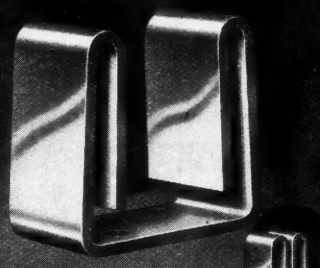

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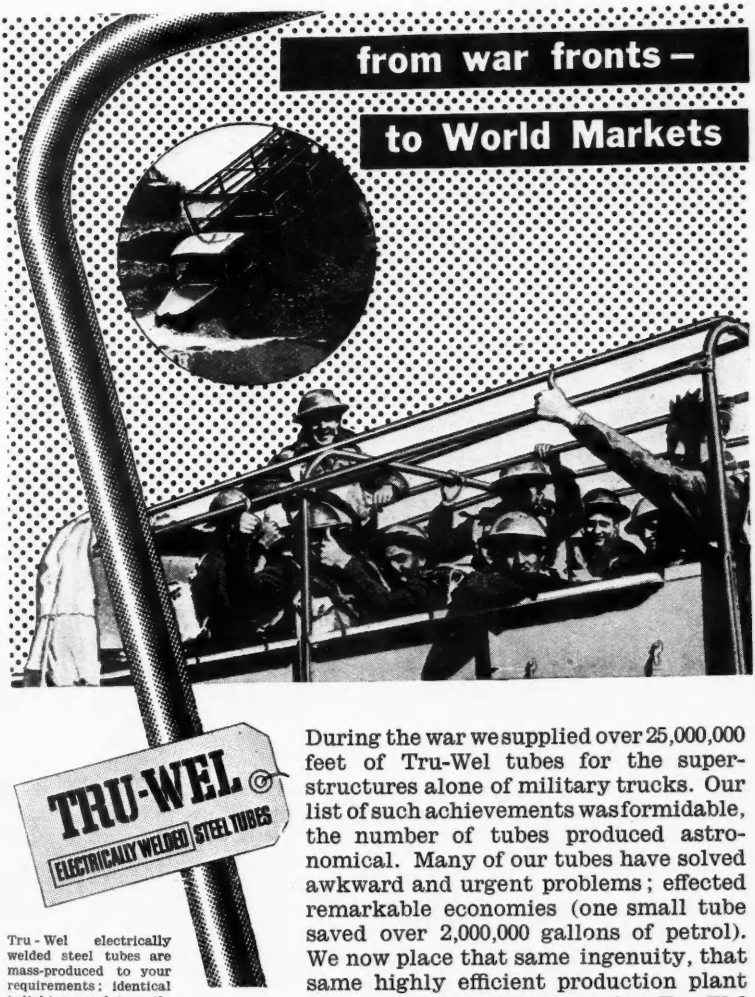

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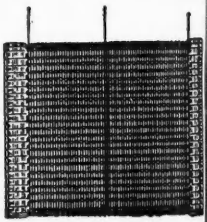

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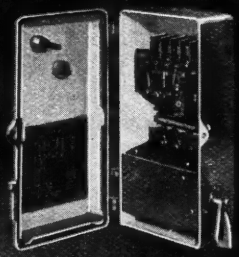

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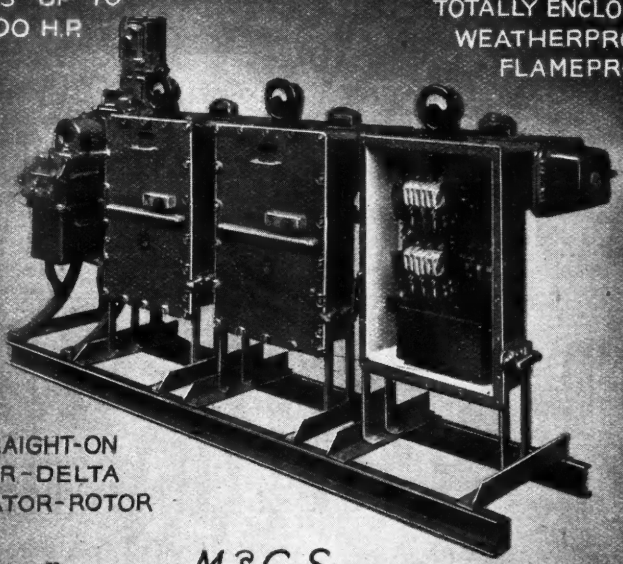

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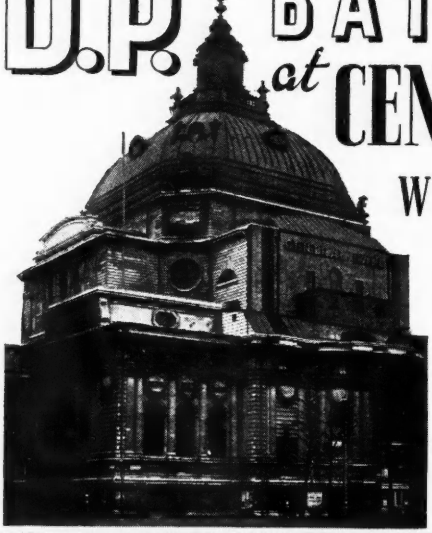

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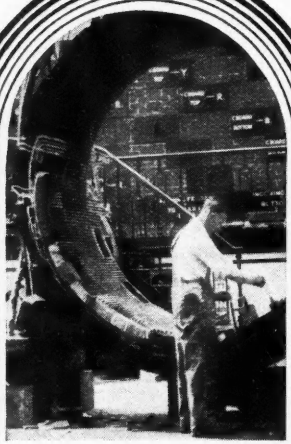

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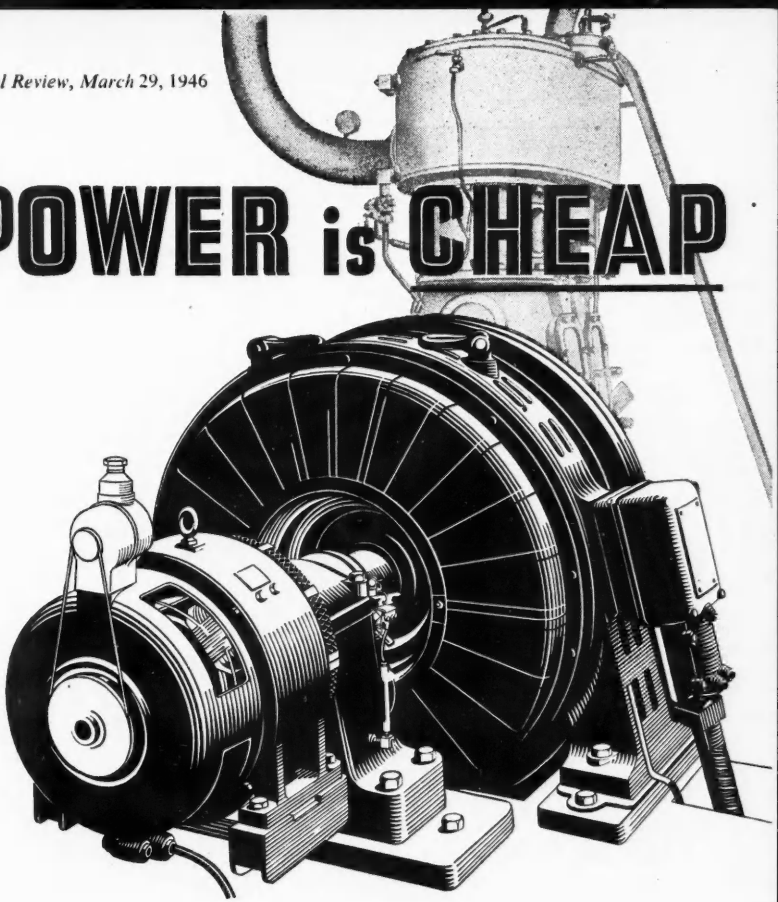

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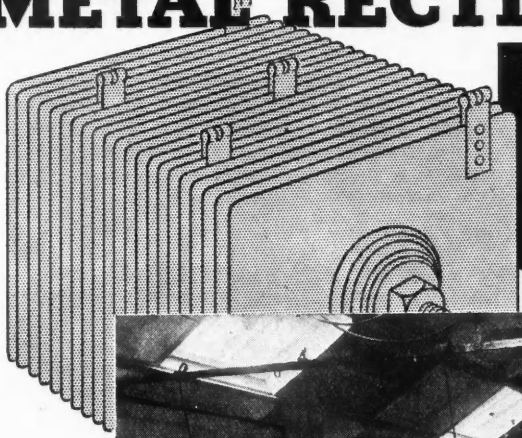

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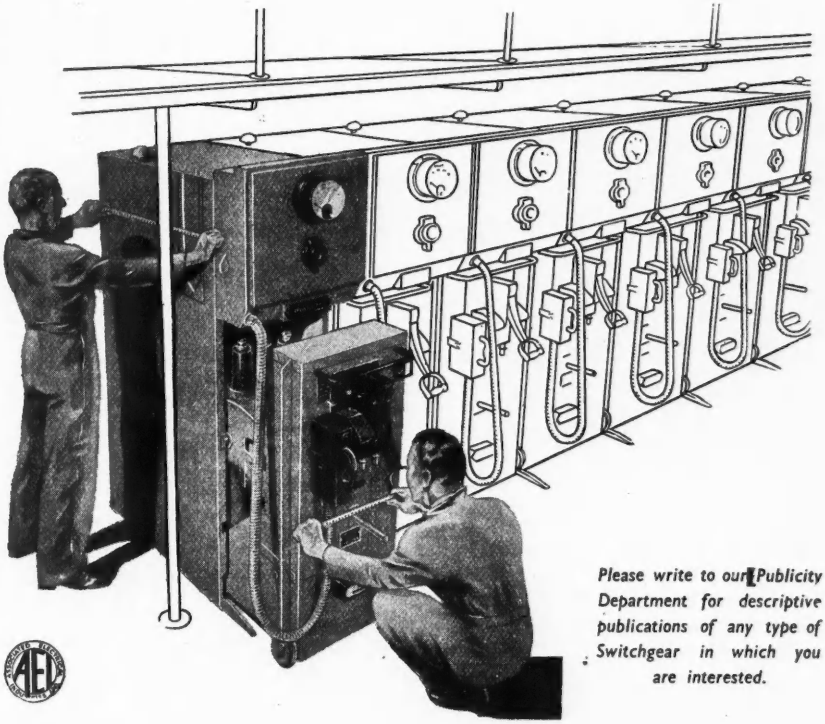

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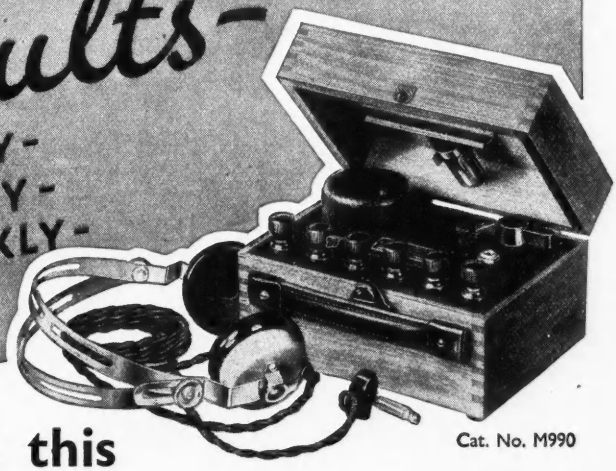

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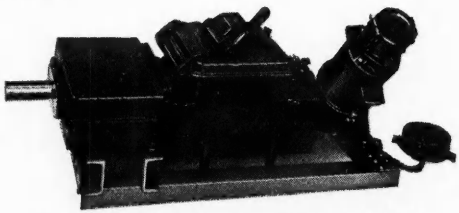

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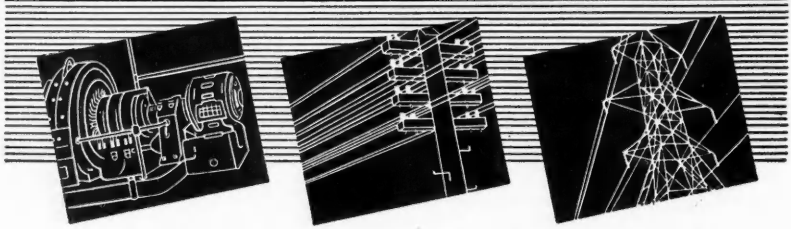

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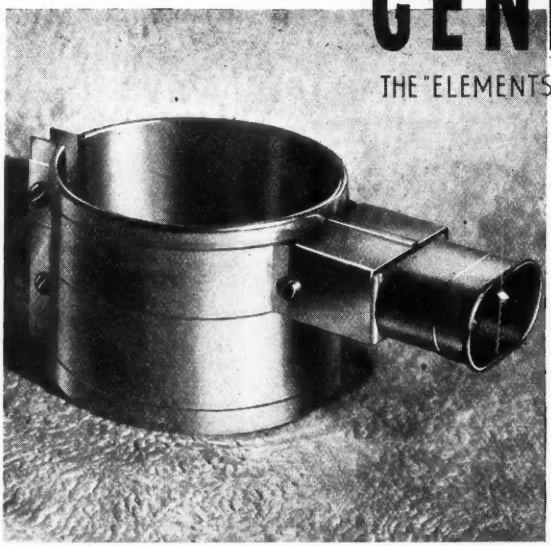

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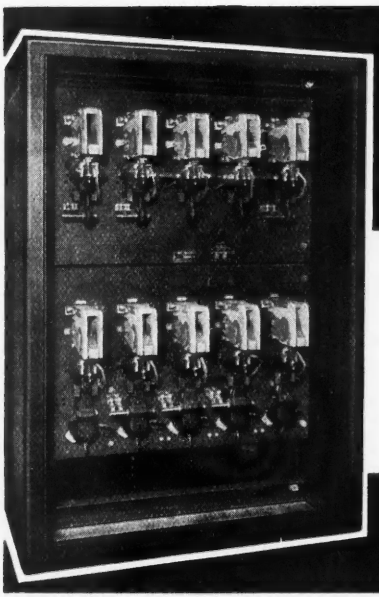

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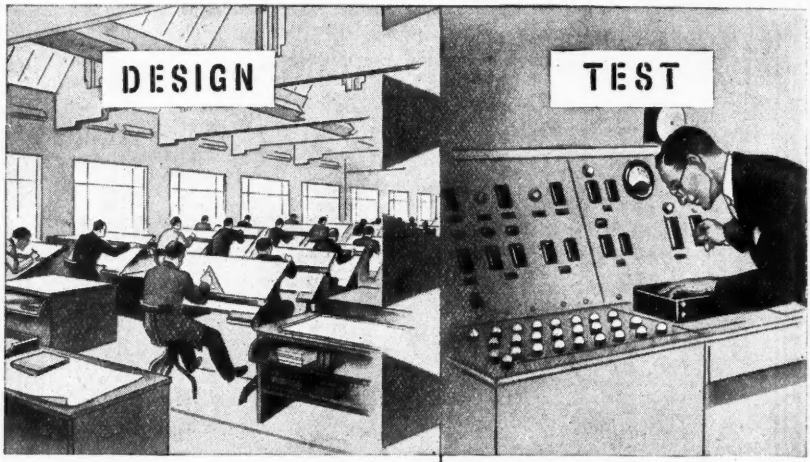

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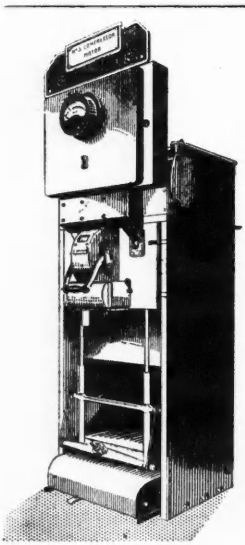

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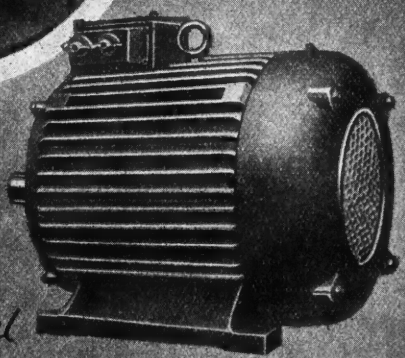

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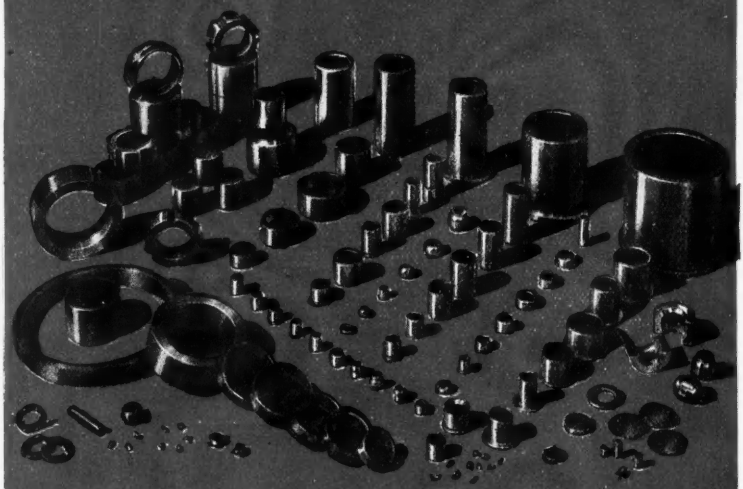

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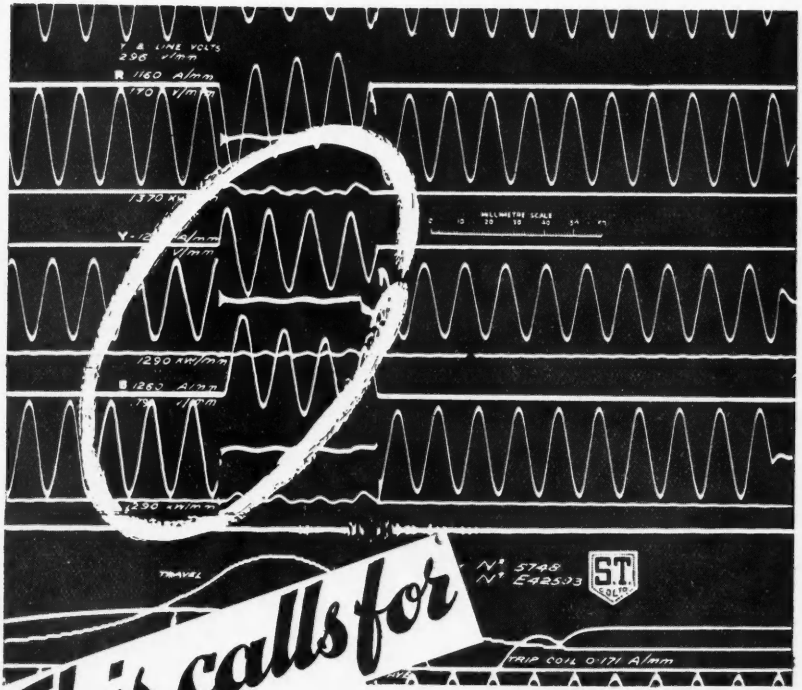

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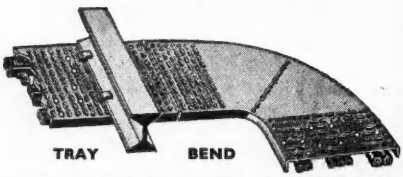

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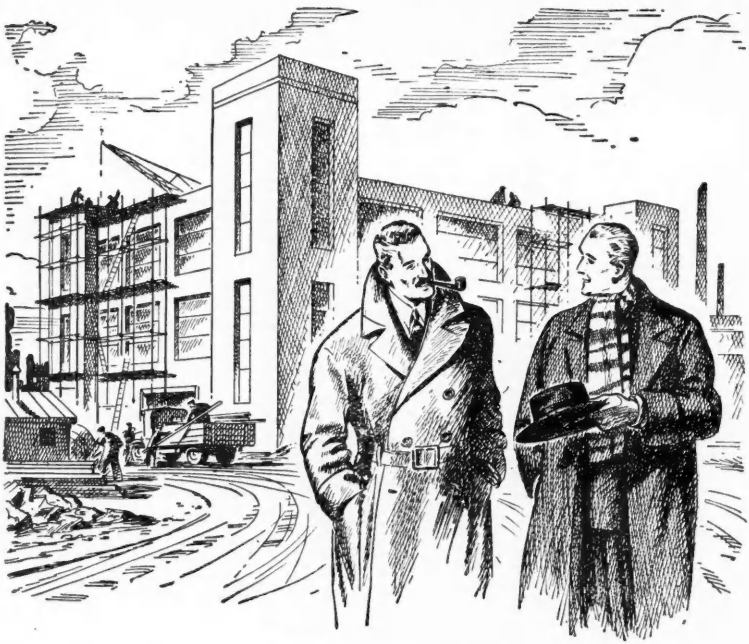

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ELECTRICAL REVIEW

March 29, 1946

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Technical Editor :
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J. H. Cosens

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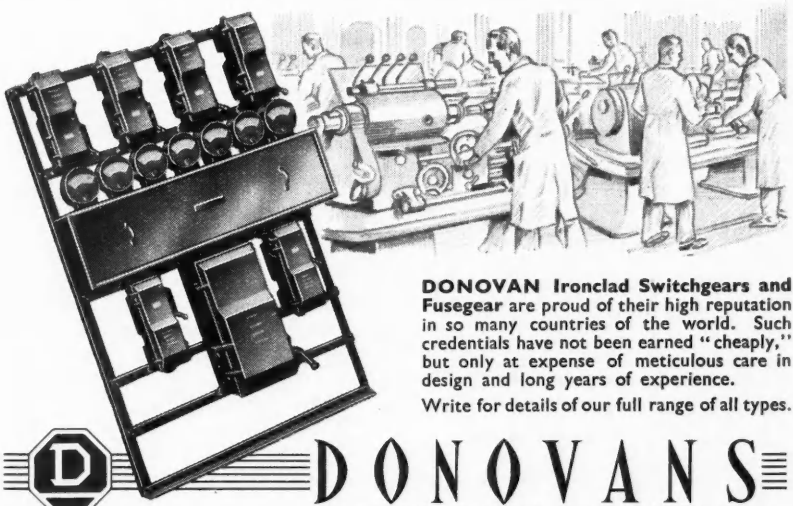

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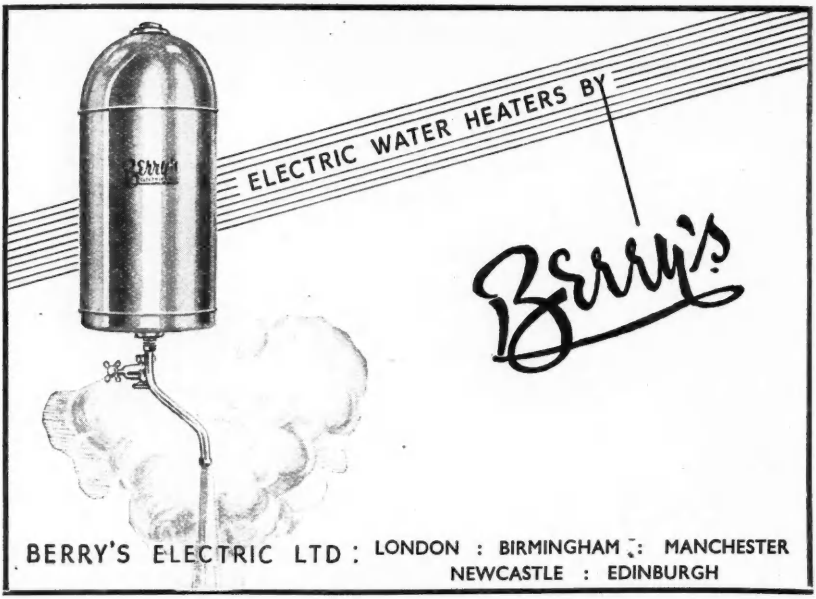

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ELECTRICAL REVIEW

THE OLDEST ELECTRICAL PAPER — ESTABLISHED 1872

Vol. CXXXVIII. No. 3566. MARCH 29, 1946 . 9d. WEEKLY

More About Nationalization

Company Chairmen's Views

GAS interests are as much concerned about nationalization as is the electricity supply industry. In the absence of any strong opposition to the proposal of the Heyworth Committee that the gas undertakings should be acquired and operated by regional boards, it had been assumed that the industry was resigned to some such fate. Now, however, the National Gas Council has come out with an appeal to the Ministry of Fuel and Power to defer action for at least the next two or three years. The Council asks that in the meantime the gas industry should be encouraged to develop on evolutionary lines. Any hasty action now, it is said, will militate against the industrial recovery which is so urgent and necessary.

What Advantage in Postponement ?

It is quite probable that any upheaval in the gas industry will retard recovery and is to be deprecated, but it is difficult to see what benefit for the gas industry itself can arise out of postponement of the evil day. There may be a shadow of a thought that the Government may change colour in two or three years, but surely that would be a reason for speedy action.

Spokesmen for the electricity supply companies eschew temporization and say flatly that public ownership will not bring about any improvement in electricity supply, let alone cheapen it. They therefore advocate a minimum amount of interference with the industry. Sir Robert Renwick told the shareholders of the County of London Electric Supply Co. last week that nationalization would " put paid to cheaper supplies of electricity "; he contended that there would be no protection for the consumer and that under a " co-ordinated " fuel and power system electricity supply would have to bear the losses on the gas and coal industries. He might have said that electricity supply was already bearing a disproportionate part of the coal industry's losses or subsidies.

Effect upon Individuals

At the City of London Electric Lighting Co's. meeting Mr. John Braithwaite pointed to the industry's progress in recent years and expressed the opinion that although under nationalization the Government would have to employ the men who were already running the industry, the tendency would be " to diminish responsibility, to restrain individual enterprise, to blunt keenness." In his view control on the lines of the 1925 Acts governing supply in London would cause practically no disturbance of capital and yet would completely safeguard the interests of the nation.

The chairman of the Electrical Distribution of Yorkshire, Ltd., Mr. R. W. Wickham, said that the Government had given no indication of the nature of the " benefits " which it was hoped to secure from nationalization. The industry had men capable of tackling any problems arising from public ownership but it would be better for their energies to be directed to developing the industry instead of dealing with problems that need never be raised or, at least, raised at this difficult

time in our economic history. These statements, though admittedly *ex parte*, contain much for the Minister of Fuel and Power to ponder over. It is most unlikely that they will deflect him and the Government which he represents from proceeding with their plans for public ownership or control but they may influence the form which that control will take.

Consumers' Tariffs

ABOUT sixteen years have passed since the publication of the "Report on Uniformity of Electricity Charges and Tariffs" by a committee under the chairmanship of Mr. A. C. Cramb (then representing the I.M.E.A.) appointed by the Electricity Commissioners. This Committee made a study of the effects of the various forms of tariff then in vogue and said that it was "strongly of the opinion that the present multiplicity of tariffs should cease." As regards domestic consumers it recommended the "size-of-house" method of calculating the fixed charge rather than the use of rateable value as a basis.

Persistence of Variety

SINCE 1930 there seems to have been a little progress towards uniformity but we are still so far from the desired goal that the Commissioners have considered it necessary to appoint another committee to review the position and make recommendations as to the best form of common tariff. In spite of the earlier Committee's views, undertakings appear to have continued to favour the rateable-value method of assessing the fixed charge. This has often proved inequitable in small areas, in which uniformity of assessment might be assumed; it will certainly lead to anomalies in the larger distribution districts which are generally envisaged for the future. But we must not do the new committee's work in advance of its appointment. The interested bodies have been asked to make nominations and we must be content at the moment to wish the committee success in its far from easy task.

Growing Exports

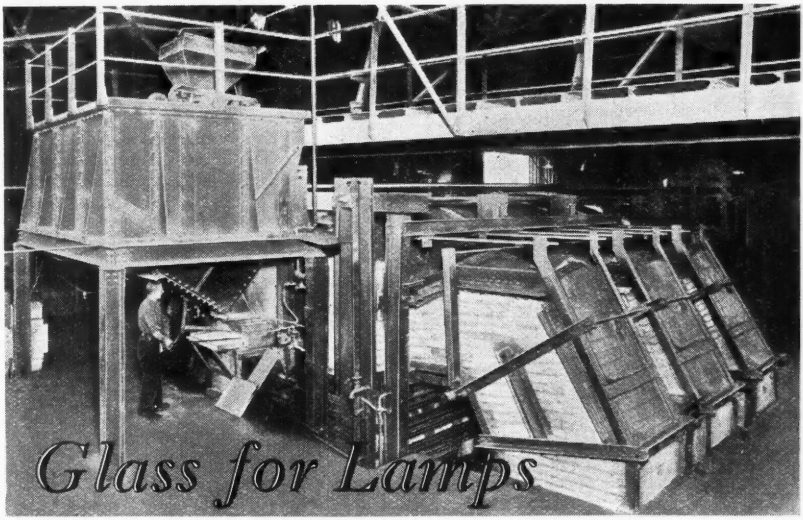
IN this issue we reproduce statistics of electrical exports and imports from the Board of Trade's February returns. We congratulate the Board on diminishing the gap between the end of the period and the date of publication; the February figures appeared not much later than they would have done before the war. The electrical industry's progress towards its aim of raising exports to, perhaps, twice the pre-war level was accelerated during the month. As regards value they were about 63 per cent up on the 1938 monthly average; exports as a whole advanced by 53 per cent. Good as this is, it has to be remembered that in terms of volume the pre-war level has not quite been reached yet. Nevertheless this achievement in a period of reconstruction is remarkable and praiseworthy.

Present and Future

SINCE research is now recognized in the highest quarters as the source of future industrial progress, its financing is unlikely to be the worry that it was at one time. The crux of the problem nowadays is in transferring the results of research from the laboratory to the workshop, as was clearly indicated in many of the papers presented this week at the F.B.I. Conference reported on a later page. This involves pre-eminently decisions as to when the introduction of new or improved products for to-morrow are worth the risk of impeding the manufacture of goods for to-day. Production on a miniature scale by the research department itself, when feasible, is one good way of convincing the works men of the practicability of an idea.

The Personal Factor

MOST research now is essentially team work, not only in the department itself but also in conjunction with other sections of a manufacturing concern. A further qualification is thus required of those carrying out applied research—the ability to co-operate with and get their ideas across to men having a different way of looking at things. No improvement in machine efficiency is ever likely to provide a substitute for the human bond, such as that formed in working for the same organization. This in itself would be enough to justify the setting up of industrial research departments, as distinct from independent research associations, for which problems of more general interest, including conjoint investigations for small bodies, should provide as big a scope as it is within their power to compass.



Making Components for Standard Metal Filament Types

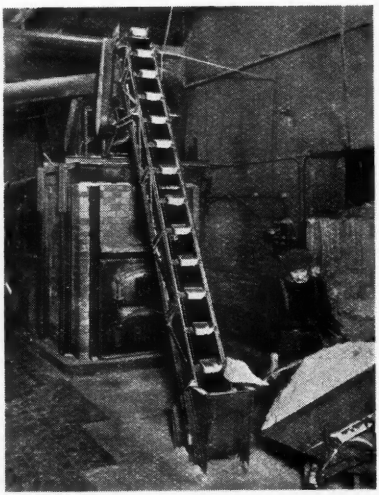
IN this and a later article we propose to describe the processes in the manufacture of the standard metal-filament electric lamp, and we are grateful to the General Electric Co., Ltd., for their ready and favourable response to our request for permission to visit their glassworks and lamp factory at Wembley and for their co-operation in our task. Space restrictions prevent us from dealing with both works in one article, so this article is devoted to the manufacture of the glass components of the lamp, i.e., the bulb, and the flange and exhaust tubes and the filament-holding rod which are contained inside the bulb. When finished, these components comprise the glassware raw materials required for the lamp factory.

Materials for glass making are seen in the title illustration being fed by truck into one of the tank melting furnaces

In principle there are two distinct production flow lines in the factory, consequent mainly on the different characteristics of the components with regard to shape, but also on the different classes of material with which they are made. One flow line produces the bulb only, and the soda glass for this is made from sand, soda, lime, felspar, etc., whereas in the case of the glass for all the three inner components the raw materials include, in addition to the sand, a fair quantity of red lead. Lead glass has a higher electrical resistance than soda glass, and the quantity produced of the former is only about 20 per cent of the amount of soda glass made.

Let us first deal with the production of soda glass and follow it through to the finished product, i.e., the lamp bulb. The major raw material, sand, which is nearly 100 per cent silica and will pass a 30 mesh screen, is received with a 6–7 per cent moisture content, so that drying is necessary before actual processing is possible. This is effected in an Edgar Allen gas-fired, almost horizontal, cylindrical rotary equipment from which the moisture is removed at the top by suitable extraction plant. The wet sand is fed to the front of the drier by means of an inclined bucket elevator and a belt, and because of the pick-up difficulties in the case of wet sand the elevator is shovel fed.

At the rear end of the drier the dried sand is delivered to a screen, and that which passes the mesh falls on to a horizontal belt serving an elevator by which the sand is taken to the top floor of the building. There it is deposited into a collecting hopper with a reserve storage capacity which serves as the main feeding point for the whole system.

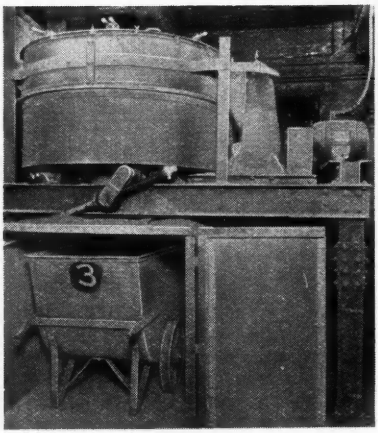


Drying of the sand is necessary before actual processing is possible

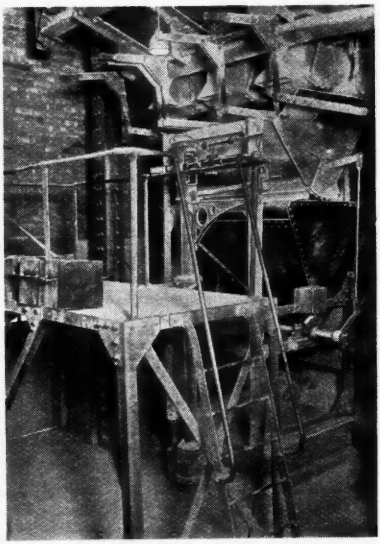
Other ingredients are also delivered to this floor by hoist direct from lorries outside the building, and they are fed to other hoppers. All these hoppers have chute deliveries to the weighing and mixing plant on the ground floor. The chutes actually deliver correct proportions of the raw materials to the bin of the weighing machine, to which are also delivered directly at this stage certain other constituents which are required in only small quantities.

The complete assembly of all the materials, correctly proportioned, is known as a "batch", and after being weighed this is passed on to a horizontal revolving mixer at the back of the weighing machine. After a thorough mixing the batch is elevated again to the middle or main working floor, so far as the handling of the raw materials is concerned, and from the batch hopper hand trucks are filled for delivery to one of the tank furnaces in which the mixed materials are melted and thus become molten glass ready for processing.

A quantity of cullet (broken glass) is also fed into the furnace, and the trucks of batch and of cullet are lifted to a gantry normal to the line of the furnace and slightly higher than the furnace-feeding hopper at the front of the furnace, into which the materials are fed by bottom discharge from the trucks. The main part of each furnace is an assembly of four tanks, with communicating channels, the floors and walls of which are constructed of refractory blocks, all contained within a heavy steel cradle framework. At the front

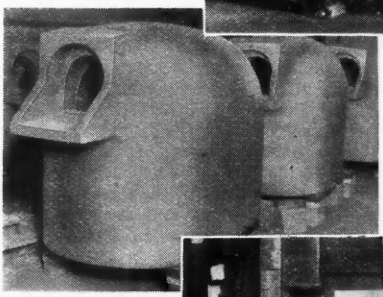


Batch-mixing machine for making lead glass for the internal components of the lamp



All the raw-material hoppers have chute deliveries to the weighing and mixing plant on the ground floor

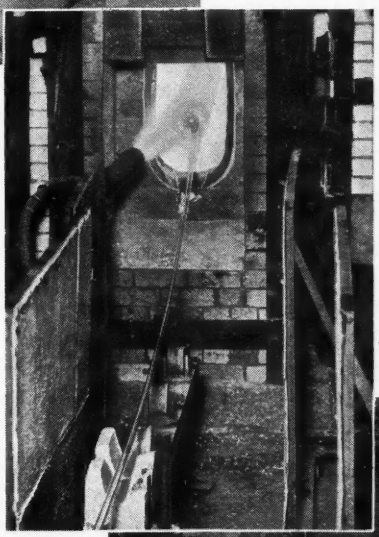
of the furnace, the feeding and firing end, there is a 50-ton rectangular melting tank which communicates by a channel with a 10-ton refining tank at the rear. At each back

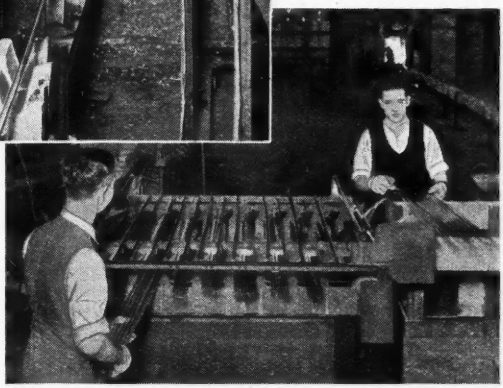


A number of clay melting containers are oused within the outer brickwork structure of the pot furnace. The manufacture of the clay pots (left) represents one of the old "father to son" family crafts

corner of the refining tank there is a 5-ton auxiliary tank from which a bulb-making machine receives its supplies of molten glass. The molten glass in the tanks is usually about 3 ft deep, the level being automatically indicated on an external magnified indication system by means of float controls situated within the furnace.

Each tank furnace is gas-fired from a gas-producing plant



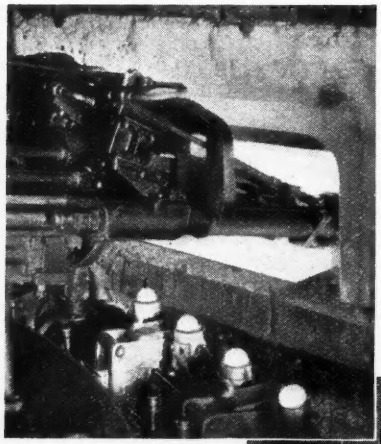


The molten glass is drawn from the revolving mandrel at the front. The tube or rod lengths are delivered to a gap-grading machine (right)

adjacent to the furnace, and in order to take advantage of regenerative heating the directions of the flow of gas into, and of the exhaust from, the furnace are changed at intervals. For this purpose there are three feeding and exhaust stacks on each side of the furnace, and the reversal of flow is effected by means of suitable valves. The temperature and pressure of the furnace are automatically controlled by a modern Electroflo installation.

We have already indicated that the tank furnace is used exclusively for making bulbs, and each of these machines is situated directly against each auxiliary tank at the rear of the furnace. One of these machines, which have simultaneous movements in different direc-

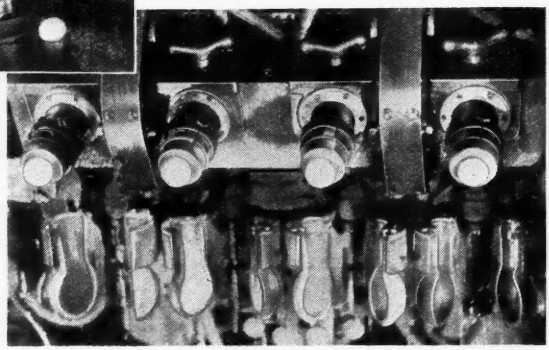
tions and thus presented us with some unusual photographic problems, has 48 bulb-carrying heads around its periphery in the horizontal plane. The heads are arranged in twelve machine sections of four heads each, and the bulbs are produced progressively as they travel round the machine. In the first place a four-member suction arm is passed into an open, but shielded, section of the auxiliary tank, and as the end of each member closes with the molten glass surface it sucks up a " gob " of glass. The arms are then withdrawn from the tank and four of the heads in one section are then ready in the vertical upward position to receive the " gobs " from the suction members.



The bulb-making machine presented us with some unusual photographic problems. A four-member suction arm is passed into the auxiliary tank; in the upward vertical position the heads receive the " gobs " of molten glass . . . . . .

Compressed air is applied internally at the back of each head, primarily in quite tiny puffs and then at varying pressures as the heads travel round the machine. The heads themselves are revolving continuously whilst they automatically take up different axial positions during their journey round the machine. The next stage after the upward vertical position is for the four heads in that section to change to the horizontal position, still revolving and still receiving their puffs of air. They then change to the vertical downward position, when the blown-out glass becomes elongated, but before this is overdone the two halves of the mould close over each plastic " tube," and as the heads proceed round the machine air pressure forms the glass to the shape of the mould.

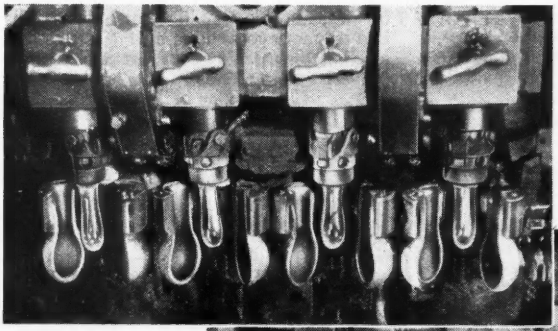
When the bulbs are set the moulds open again, and finally the four bulbs in the particular section are ready to be ejected into a multiple conveyor system which feeds the bulbs to a machine for the purpose of burning off the necks. On the burning-off machine the bulbs are held on heads with their necks downwards and travel round the periphery of the machine in the horizontal plane. At the same time each bulb is revolved individually and the neck is subjected to heating from gas jets, and at the required point the neck end drops off and the bulb is then discharged to a conveyor line which takes it through a tunnel-type furnace in which annealing takes place and the stresses set up during blowing and cooling are removed. From the annealing furnace the bulbs take a long journey on cooling conveyors before being sorted and packed for delivery as raw material to the lamp works proper. Some bulbs are first passed on to a frosting machine which is of the conveyor type, on which each bulb receives two separate internal sprayings of hydrofluoric acid.

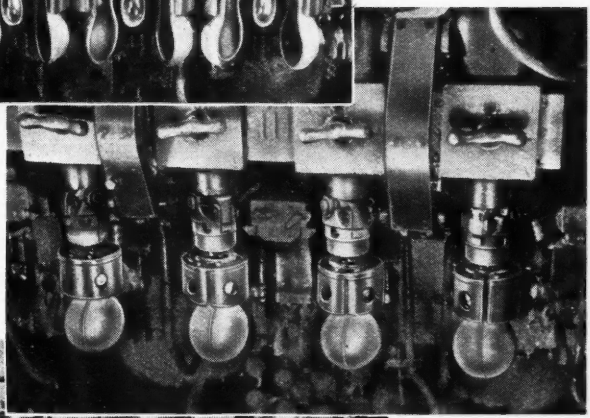


. . . . . , the heads automatically take up different positions during their journey ; heads in horizontal position

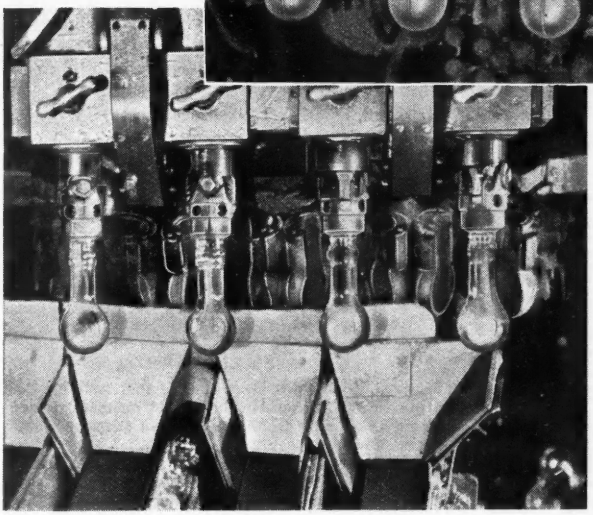
The materials for making lead glass for the internal components of the lamp are handled and mixed by rather similar methods to those

employed for the soda glass, but they are melted in quite different types of furnaces, namely, pot furnaces. One furnace structure is circular and one is rectangular, but in each case a number of clay containers in which glass is melted are housed within the outer brickwork structure which is internally fired by gas. To place any one pot in position a suitable portal has to be broken down in the brickwork of the outer structure and then rebuilt after the pot which has been previously heated in a separate "pot arch" to 1,000 deg C, has been put into position. The clay pots are made in the works, and their production represents one of the old "father to son" family crafts remaining in this country. Each pot measures, very roughly, 6 ft by 4 ft by 5 ft high, and it is built up by hand gradually to take the form of an almost completely enclosed dome-shape cubicle, but there is an aperture at the top at one end by which the glass-making materials are fed in by shovel and the molten glass is removed by ladle, both through a suitable portal in the furnace wall.





The heads move downwards (above) and the moulds then close in over the bulbs (right)



Finally the bulbs are ejected into a multiple conveyor

The molten lead glass is fed on to a flow

block and runs down into a working tank which is oil fired simply for the purpose of maintaining the required temperature. From this tank the molten glass is allowed to flow on to a revolving mandrel which is separately fired. The mandrel for tube making has a refractory body built up on a hollow steel interior through which compressed air passes through the mandrel from the back. At the same time the molten glass is drawn from the revolving mandrel at the front, and by virtue of its rotary movement and the air flow it takes up a tubular formation. The mandrel for rod making is not hollow but, except for the passage of compressed air, the process is similar.

The speed of drawing, the rate of flow of the molten material, and the size of the mandrel are the features which govern the size of the tube or rod produced. The tube or rod is drawn over rollers for a comparatively long distance to permit cooling, and the drawing machine which pulls the tube by means of two travelling caterpillar tracks is at the far or cold end of the line. A cutting machine by the side of the drawing machine delivers the tube or rod into about 4-ft lengths to a collecting belt from which they are delivered to a grading machine of the selective gap-gauge type. The tubes are next cut into short working lengths on a machine in which several lengths are simultaneously rolled over a file edge on a jig, and after sorting and polishing of the ends they are ready for delivery to the lamp works.

We are indebted to Mr. A. L. Marden, the glassworks manager, and to his production superintendent, Mr. J. B. Charters, for their help in obtaining these impressions of the process and the accompanying photographs.

PARLIAMENTARY NEWS

By Our Special Reporter

The Budget

LAST week Mr. Herbert Morrison, Leader of the House, announced that the Chancellor of the Exchequer would open his Budget on Tuesday, April 9th.

Radio Industry Working Party

On March 18th, Mr. Arthur Lewis asked the Minister of Supply and of Aircraft Production, whether he had now had an opportunity of considering the letter sent to him by the general secretary of the Association of Scientific Workers on the advisability of setting up a working party for the radio industry; and if, in this working party, he would consider the appointment of representatives from manufacturers outside the big combines.

Mr. John Wilmot said he had considered this letter but did not think that this would be an appropriate way of dealing with the questions raised in it. The Ministry was communicating with the Association.

Electrical Material for Houses

On the same day, replying to Dr. Comyns, the Minister of Supply and of Aircraft Production (Mr. John Wilmot) said that shortage of electrical material was not holding up the housing programme, although supplies were not yet sufficient to meet the demand for replacements. He could certainly give an assurance that export would not be allowed to hold up the housing programme.

Purchase Tax

On March 20th, Mr. Moyle asked the Chancellor of the Exchequer if he was now in a position to make a statement on the memorandum submitted to him on March 8th by the Shropshire, Worcestershire & Staffordshire Electric Power Co., on the abolition of the purchase tax from such necessary household articles as electric kettles, irons and washing machines.

Mr. Dalton said that his hon. friend would not expect him to anticipate his forthcoming Budget statement.

Wireless in Cars

On March 21st Sir Wavell Wakefield asked the Assistant Postmaster-General whether he had considered the suggestion that the holder of a wireless licence for a receiving set in his house should be entitled to the issue of a wireless licence for a receiving set fitted in his motor-car at a reduced fee; and what was the result of such consideration.

Mr. Burke said he had, but it was not considered that a concession such as suggested would be warranted.

Telephone Rentals

Mr. Ernest Davies asked the Assistant Postmaster-General if he would estimate the cost of a return to pre-war rates of telephone rentals and other charges.

Mr. Burke replied that on the current level of business, a return to the pre-war rates of telephone rentals and other telephone charges would involve a loss to the cash revenue of the Post Office of the order of £10,000,000, together with a loss of credit of £4,000,000 in respect of services to Government Departments at present rendered without adjustment in cash.

Views on the News

Reflections on Current Topics

IN microcosm the luncheon of the I.E.E. Installations Section provided an apt illustration of Dr. Dunsheath's reference to the value of friendly relations among engineers wherever they may be. The brief but pointful remarks of other speakers as well as of the President provided several matters for thought. One of them was the complaint of the chairman, Mr. Forbes Jackson, that too few members seem ready to submit papers. It is to be hoped that this is only a passing phase, due perhaps to post-war fatigue or else to increasing work with still depleted staffs, because the formation and successful running of special sections (an expensive business for the Institution) depend upon the prospect of enough people being willing to put their experience at the disposal of others.

* * *

I was surprised to see how quickly the London School of Electrical Domestic Science has been able to put its house in order again at 2, Basil Street, Knightsbridge, for post-war reopening. A number of friends in the industry were invited by the principal, Miss Minoprio, to an informal housewarming party last week. Some post-war appliances have already been added to the equipment of the school and although I was told that no decoration had been carried out, everything looked remarkably spic-and-span.

* * *

Deposits are to be refunded to 1,000 Finchley consumers, I see. This recalls a suggestion made to me some time ago that it would be a good idea to persuade a supply authority to accept a substantial deposit in this "cheap money" era. The reason given was that under Section 71 of the Electric Lighting (Clauses) Act, 1899, the authority is required to pay interest at the rate of 4 per cent per annum at six-monthly intervals —a much better rate than can now be obtained anywhere else for deposited money.

* * *

An abortive attempt by a group of British industrialists to stave off war between this country and Germany was referred to in the course of the trial of Göring at Nuremberg. The witness was Hr. Dahlerus, a Swedish industrialist, who said that he and Göring had met this group at a remote farmhouse on the west coast of Schleswig in early August, 1939. Among those present were Sir Robert Renwick, Bt. (County of London Electric Supply Co.), Mr. G. F. Spencer (Associated Electrical Industries), who has since died, and Mr. T. Mensforth, then a director of the Hotpoint Electric Appliance Co. A statement has since been issued on behalf of this group to the effect that they impressed upon Göring Great Britain's hatred of war; it was made clear to him that the invasion of Poland would not be tolerated.

* * *

This reference to Messrs. G. F. Spencer and T. Mensforth reminded me of their association in the production of a memorandum, in 1937, on the McGowan Committee's proposals for the reorganization of electricity distribution. In their view, compulsory amalgamation of undertakings was likely to receive little support and they suggested a Bill containing provisions for securing co-operation and mutual assistance among supply authorities. This, it was thought, should include the setting-up of a National Electricity Council for the industry and a National Committee and District Committees for reorganization within the industry. Mr. Spencer's qualification for this study was his membership of the Williamson Committee on Electricity Supply (1917–19).

* * *

Appreciation of the germicidal qualities of ultra-violet rays has gained considerable ground recently. One of the most recent uses of u.v. lamps in this country is for purifying the atmosphere of factories where penicillin is made. In America, besides being utilized for meat storage, food processing and packaging, several installations of the lamps have been carried out in hospitals, schools, factories and offices. Results recorded show remarkable success in counteracting epidemics. In schools at Philadelphia the measles attack rate did not exceed 2½ per cent of susceptible pupils in irradiated classrooms, whereas in unirradiated rooms it was as high as 22 per cent.

* * *

It is reported by the *Farmer and Stock-breeder* that members of the Gloucester branch of the National Farmers' Union have expressed the hope that all the electricity companies will get together and agree on a scheme which would offer a service to all the farms in the country. This is all right, but I think that in present circumstances the threat with which the report concludes is rather funny: "If that was not done, it was stated, they might be forced to ask for the nationalization of the industry."

—REFLECTOR.

Silicon-Carbide Resistors

Nature of the Surface Layer

THE paper on "Silicon-Carbide Non-Ohmic Resistors" by MESSRS. F. ASHWORTH, W. NEEDHAM and R. W. SILLARS referred to in our last issue (p. 452) was read and discussed at the Institution of Electrical Engineers on March 21st. Opening the discussion, Professor E. B. MOULLIN said that there was a wide range of applications for these resistors on the industrial side. He was disappointed at the statement that it was rarely convenient to run them at more than 150 deg C; he had hoped that it would be possible to run up to 800 or 900 deg C.

Thickness and Resistance

DR. A. FAIRWEATHER (P.O. Research Station) said that other workers had realized the possibility of a surface layer, but had looked for it by X-ray and other methods without success. Could the authors assert, beyond any shadow of doubt, that a silica layer did, in fact, exist? The resistance of the disc was dependent on its thickness; to what extent was it possible to reduce the thickness in order to secure satisfactory behaviour? Experiments at Dollis Hill indicated that it was not readily possible to reduce the thickness below 15 or 17 mils. Among lesser-known applications was the use of these resistors for protection of transmission lines.

MR. J. MCGAVIN (Automatic Telephone & Electric Co.) emphasized the importance of the practical effect of specification tolerances and said it was not easy to make the user appreciate that two discs to the same specification taken from a batch could vary in the voltage they passed in a 3 : 1 range.

MR. F. R. PERRY (Metropolitan-Vickers) pointed out that as the scientific reasons for the electrical behaviour of silicon carbide were not fully understood, it was difficult to try to control its electrical properties. It was possible that the colour of the crystals was a guide to the electrical properties but that was very empirical because one did not know what controlled the colour. He believed the authors were on the verge of producing a very much better material in the not too distant future.

MR. G. BAKER (Automatic Telephone & Electric Co.) believed this was the first paper to go into the problems of specification. After discussing the mathematical reasoning in the paper he said he did not believe that the silicon film which had been mentioned really existed.

MR. C. BOWDEN said he had been working on what he believed was an original idea in connection with the use of silicon-carbide resistors, but one deplorable thing about them was poor reproducibility within fine limits.

MR. G. LYON said he also had had experience of applications in which there had been difficulty in obtaining discs sufficiently thin for use at low voltages.

DR. SILLARS, replying to the discussion, agreed with Professor Moullin that surface layer phenomena were likely to play an increasing part in electrical matters in the future. As to the silica layer, the authors themselves were a little dubious about its existence. All that could be said was that the balance of evidence was in favour of the layer being silica, but there were other possibilities. There was also a certain amount of correlation between the physical appearance and size of grain, and the electrical properties, but just what it was the authors were unable to say.

Cathode-Ray Tubes

THE relative merits of electrostatic and magnetic means of deflecting the beam in cathode-ray tubes were compared at the February discussion meeting of the Radio Section in London of the Institution of Electrical Engineers.

The subject was introduced by MESSRS. E. W. BULL and V. A. STANLEY and in the ensuing discussion (twelve speakers took part) the use of a mixed system of deflection received some support, although the combination also had its disadvantages. Some speakers felt that magnetic deflection would become more difficult with higher definition television because the greater number of scanning lines would involve a greater rate of change of current in the deflector coils. For oscilloscope purposes electric deflection was generally the more suitable. The final choice must be governed by careful balance of both tube and associated circuit considerations as well as the nature of the work the tube was intended to do.

Meter Laboratory Records

Construction of Log Sheets

By S. A. Daines, A.M.I.E.E.

THE finishing touch to the efficiency of a laboratory is the methodical, orderly recording of test results. Too rigid following of any set procedure for noting first results is not recommended, but as soon as that phase of the testing where "near-to-final" results are being observed is reached, then it is most essential that scraps of paper be discarded and a neat, well-designed log sheet be introduced.

Dependent upon the minimum amount of information required at any subsequent date for the purpose of re-checking calculations the log-sheet details are kept as concise as possible. Numbered log sheets can then be filed in a loose-leaf binder with cross references to numbered pages in a permanently bound log book in which final results are entered for the perusal, approval and signature of the meter examiner.

The information in the log book is set out with a view to facilitating the examiner's requirements so that he is able to pin-point particular trends in the instrument's performances throughout its working life. Apart from the immediate test results he is able to check at a glance any tendency to instability, and also by means of the aforementioned cross references to re-check actual test calculations if necessary.

With the normal periodical testing of standard or sub-standard apparatus used for the purpose of the Electricity Supply (Meters) Act, 1936, such log sheets and log books become a prime necessity for a meter testing station, and they provide a means of permanently recording test results in a manner beneficial both to the examiner and the testing station alike. Each log book has 200 pages, measures 9 by 13½ inches and is bound in dark brown leather having gold external lettering.

The loose instrument test sheet, numbered in the top right-hand corner and giving particulars of the type of make, model and number of the instrument and a reference to the log-book folio number, is in two sections with common headings for stability tests and working tests. These column headings with their sub-divisions are as follows: Marked range; amps, volts. Instrument reading. Voltage; voltmeter reading, volt box range, potentiometer readings (forward and reversed). Current; shunt range, potentiometer (forward and reversed). Watts; forward, reversed, mean. Percentage correction. Remarks. Underneath are noted the date, the air temperature (deg. C), the number of the standard cell used and its voltage and temperature.

VOLTMETER No.....

Make..... Model..... Test Sheet Ref. No.....

STABILITY TESTS

Marked range	Instrument reading	Nominal volts	Difference between last and present tests	Lowest percentage correction	Highest percentage correction	Maximum difference since first test	Percentage correction
WORKING TESTS							

A correction is given as a percentage of the instrument reading, and when positive is to be added to, and when negative to be subtracted from, the reading in order to obtain a true indication.

Air temperature.....°C.

Date.....19.... Signed..... Date.....19..

Meter Examiner.

The main features of the log-book entry form for a voltmeter are reproduced. The page for a wattmeter is similar, except that the " Marked Range " column is subdivided into " Amps and Volts " and a column (coming second) is inserted for " Applied Volts." " Nominal watts," of course, takes the place of " Nominal volts."

There is a form for time standard and sub-standards with headings for date, number, air temperature in deg. C, period of test, time of test, tested against, errors (sec. fast or slow, clock sec. in 24 hr., watch percentage), initials of tester and remarks. Another form for a rotating sub-standard includes the number, make, type, current range and voltage in the sub-title. In the first column is printed the percentage of marked current (125, 100, 50, 25, 10 and 5); the other columns are headed 1, 5, 10, 25, 50 and 100 amperes and have sub-headings in each case for unity and 0·5 lagging power factors. At the foot of the form are recorded the air temperature and date of test and the signature of the meter examiner and date.

Acknowledgment is made to Mr. P. G. Campling, chief engineer and general manager of Bedford Corporation electricity undertaking for permission to publish the above information.

British Standards

New Specifications: Plastics Certification

Motors and Generators.—In the past there has been no British Standard Specification for motors and generators of the sizes covered by B.S. 168 and insulated with Class B material. An addendum has therefore been issued with the object of widening the scope of that specification to cover machines insulated with Class A and Class B materials. The former include cotton, silk, paper and similar organic materials when impregnated or immersed in oil; also the substance known as enamel applied to enamelled wire. Class B material includes mica and asbestos and similar inorganic materials in built-up form combined with binding cement, the temperature-rise limits for which are from 10 deg C to 35 deg C higher than for Class A material, depending on the type of winding. The actual figures are fully set out in the leaflet P.D. 418, copies of which may be obtained gratis from the British Standards Institution, 28, Victoria Street, London, S.W.1.

Certification Mark for Plastics.—The Mark Committee of the B.S.I. in collaboration with the British Plastics Federation has drawn up a certification scheme applicable to plastic materials and to products made of plastics. The mark may be used under licence from the B.S.I. by manufacturers of plastic materials which conform to a B.S.I. specification and to manufacturers of mouldings, provided that such articles comply with the relevant B.S.I. specifications. The use of the certification mark is intended to give the purchaser an assurance that the product conforms to a recognized standard in respect of both material and workmanship. A series of specifications for particular articles will be issued in due course, but it will clearly be impracticable to prepare individual specifications for every type of article that can be made in plastics. A general definition of " technical mouldings," laying down the minimum requirements to be complied with by a moulding to qualify for the use of the B.S.I. Certification Mark has therefore been published as B.S. 1253: 1945, copies of which can be obtained from the British Standards Institution, price 1s.

H.F. Conductors.—Conductors designed for the manufacture of low-loss coils for use in high-frequency circuits are dealt with in B.S. 1258. They comprise copper wires individually enamelled, bunched together and covered with one or two lappings of silk or silk substitute. This specification does not include conductors employing the special construction known as litzendraht (litz). A range of recommended standard sizes of single and double covered conductors is given, together with requirements regarding limpness, length of lay, overall dimensions, number of joints permitted, reeling, labelling and packing. Standard methods of test are included in appendices. Copies may be obtained from the British Standards Institution, price 2s., post free.

South Wales Station

THE South South Wales Electric Power Co. has applied to the Electricity Commissioners for a Special Order to enable it to acquire land in the parish of Llanover Fawr, Abergavenny, Mon., and to erect a power station there, the Usk generating station. Copies of the draft Order may be obtained (2s. each) from the office of Mrs. A. B. Williams, The Post Office, Llanover, or from Sydney Morse & Co., Alder House, Aldersgate Street, London, E.C.1. The draft Order and relevant documents can be inspected at the County Hall, Monmouth, or the offices of the Abergavenny Rural District Council.

Notice of objection by interested parties must be given to the Electricity Commissioners by April 16th, copies of the objections being sent to the company at the same time.

At a recent meeting the Abergavenny R.D.C. decided to support the company's proposal.

CORRESPONDENCE

Letters should bear the writers' names and addresses, not necessarily for publication. Responsibility cannot be accepted for correspondents' opinions.

Plastic-Insulated Cables

REFERRING to the paragraph in your issue of March 15th, headed, "Cable Makers' Classification," we feel that some comment is called for concerning the statement which reads:—"The Committee agreed that with the increasing supplies of rubber the use of plastics was rapidly diminishing."

Our experience and that of other manufacturers of plastic-insulated wires and cables is rather the reverse, as in spite of the diminishing requirements for direct war applications, the demand for plastic-insulated conductors has increased to a considerable extent, both for the home and export markets. Therefore, those manufacturers who did not consider thermoplastic insulation purely as a "war emergency substitute" just good enough to fill a gap caused by the shortage of rubber, and concentrated their full activity on development and mass production, can to-day hardly cope with the increasing demands for all types of plastic-insulated conductors.

The paragraph can therefore be valued only as the private opinion of one or more of the members of the Joint Industrial Council for the Cable Making Industry, but in view of the many advantages which can rightly be claimed for all those extruded thermoplastics, which have, to no small extent, helped to win the war, we feel it our duty to draw to the attention of your readers, the fact that, in our experience, the use of plastic insulated wires and cables is not diminishing but is playing a very great part, not only in the rebuilding of this country, but also in the world market.

Feltham, Middx. DURATUBE & WIRE, LTD.
R. W. BISHOP,
Sales Manager.

Boiler Control

IN his letter in your issue of March 8th, Mr. H. Giesbers comments on the article on unified boiler control of p.f. fired boilers (*Electrical Review*, February 8th and 15th) and expresses his preference for commutator motors. It is necessary to realize that in this case any complications of the d.c. scheme are at least equalled by the necessity of using individual circuit-breakers for all motors and of providing arrangements for and remote controls of individual speed adjustments (brush-shifting gear or induction regulators) and by sequence interlocks for various services (an inherent feature in unified control). The best proof that this unified boiler-control system can stand sound technical and economic competition with any other system of boiler control is the fact that there are, in operation or on order, installations for approximately 10,000,000 lb per hour of aggregate boiler capacity.

Superimposing of automatic control on unified control is easier, better and cheaper than on any other system of control because this system already incorporates inherently the correct co-ordination of speeds of the various services. Furthermore, when the automatic control is out of commission no other system provides co-ordination of the boiler auxiliary services.

Manchester. W. SZWANDER.

Factory Lay-outs

THE transition from war to peace will mean new factories and additions to existing ones, so that we can increase external and internal trade. Drawings showing the proposed lay-out can be visualized by draughtsmen but not so well by the directors and managers unless they happen to have had drawing-office experience.

Before embarking on a scheme which may cost thousands of pounds the directors discuss the lay-out with the whole staff of the factory. The foremen, though having a special knowledge of the industry, cannot seriously discuss the scheme because they cannot read the drawings, and often become "yes-men," thinking that those higher up understand. They see the "snags" too late when the shop is built and the plant is installed.

To avoid such waste, foremen should be given a fair chance to visualize the proposed scheme by providing a small-scale working model. After the manager has explained it to them the foremen could discuss it amongst themselves. A draughtsman could be in attendance to help them and to make a report of any suggestions and weak points in the scheme.

C†

If heavy material has to be moved from place to place in a shop, special conveyors might be necessary. These would appear on the model and no doubt the foremen would see where bottle-necks are likely to occur. Probably a further discussion with the manager would lead to a workable scheme and a revised model could be submitted to the directors for approval.

"BOUCHER."

Illumination Values

ALTHOUGH "Reflector's" remarks on this subject have led to a very interesting discussion, I feel that some of the relevant facts have not been sufficiently emphasized. As an example the quoted Regulations require the stated minimum level of 6 ft-candles without prejudice to the level required by the nature of the work. Thus for most purposes a much higher level is envisaged.

In the majority of factories the areas to be illuminated are large in proportion to the distance around their periphery. When the diameters of these areas are large compared with the distance between adjacent fittings the plane of reference may be lowered, or the fittings may be raised without materially affecting the resultant illumination, providing that the uniformity on the initial plane of reference lies within normal limits. No change of lamp size is necessary as the result would be increased illumination.

Mr. Downer endorses Mr. Harwood's view that the discrepancy between the quality of artificial light and daylight causes the former to be harmful. May I point out that the greatest care must be taken to provide only the most correct reflecting surfaces in interior decoration, if the light resulting from indirect illumination is not to be of a quality much more removed from that of daylight?

If we consider an interior lighting installation which gives reasonable colour appreciation and which complies with the aforementioned Regulations, we find that the greatest single factor leading to fatigue is a lack of unidirectional effect. This is exemplified by natural exterior daylight during some of the less usual meteorological conditions fairly frequently observed in this country.. Only when the above fact is fully appreciated, and when adequate attention is paid to the surrounding reflecting surfaces, will truly suitable artificial lighting conditions be made available.

I believe that the explanation of the more widespread use of glasses, though true, is not the only reason for the phenomenon. A factor of considerable importance is the advance of education and science which has caused the frequent or continuous performance of critical visual tasks to change from a one time uncommon, to a present commonplace feature of everyday life. Thus defects of vision are brought more forcibly to the notice of the individual.

Birmingham, 20. H. G. BATSON,
Adm. Sig. Establishment.

Cable Jointing and Breakdowns

WITH reference to Mr. J. W. Milan's letter in your issue of March 8th, I have had experiences similar to his own, but I have known many cases in which the maintenance engineer is at fault, either through apathy or lack of knowledge. I could cite many instances of failure of supervision due to inability to discriminate between good and bad workmanship. On one undertaking any attempt by newly joined skilled men to adopt improved methods was greatly resented by those in charge.

The rates of pay offered for some of the vacancies for plumber jointers that are advertised would not attract a good navvy, but if an interview is secured it is immediately apparent from the questions asked that what is required is really a working engineer.

Your supply notes have referred to warnings issued by undertakings to the public against having work carried out by unskilled men, but how is a layman qualified to discriminate between skilled and unskilled, and what aid towards doing so does a potential consumer get from the undertaking? In my view only compulsory registration will give the requisite protection to employer, conscientious workman and consumer.

"VOLTA."

Supplies of Apparatus to Contractors

MOST electrical contractors during the war found it impossible to obtain skilled labour. Now it would appear that lack of material and accessories is to prove a further stumbling block. The position in regard to material is infinitely worse now than during the war, which is strange; but stranger still, one can see radiators, hotplates, etc., of well-known makes in hardware stores, stationers' and even in pawnbrokers' shops.

When legitimate electrical contractors apply to the manufacturers for such things, they are informed that there is little hope of

obtaining any and in any case no promise of delivery can be given. It would be interesting to learn the source of supply to people outside the electrical trade; perhaps some of the manufacturers can explain.

Glasgow. ALEX. MILNE, SENR.

High-Frequency Heating

WITH the rapidly increasing use of high-frequency heating in industry, it would be most unfortunate if a faulty nomenclature introduced at this stage were to become accepted through common usage. For this reason we cannot pass unchallenged your editorial comment and the opening paragraph of the article "H.F. Inductor Heating" appearing in your issue dated March 15th. In them a deliberate differentiation is made between the term "induction heating" to signify high-frequency melting and "inductor heating" to mean heat treatment. We consider such a lead from an informed source to be definitely dangerous, as it ignores the technical basis of the two processes and the accepted definitions of the words used.

Electrically heat treatment and melting are the same basic process, i.e., the heating of a metal charge by induced currents. They are both "induction heating" by means of "inductor coils." The difference is purely one of degree, namely, the final temperature to which the installation is designed to go, and we can only differentiate between them by reference to this degree, e.g., by the adjectives "melting" and "hardening."

We could quite logically distinguish between the systems used to produce the high-frequency power by such terms as "alternator induction heating" and "vacuum-tube induction heating," but these are a little cumbersome. With greater facility we might agree to differentiate between "high-frequency heating" when referring to frequencies below say 15,000 cycles (the alternator range) and "radio-frequency heating" above that frequency (the vacuum-tube and spark-gap range). At all costs, however, we must avoid the artificial splitting of a single heating technique by a doubtful use of accepted electrical terms.

*London, W.C.*2.

GENERAL ELECTRIC CO., LTD.
T. SETTLE, Ph.D., M.I.E.E.,
(*Manager, Industrial Heating Dept.*)

British Plastics Federation

THE annual general meeting of the British Plastics Federation was held on March 20th. The chairman, Mr. H. W. Graesser-Thomas (Yorkshire Tar Distillers, Ltd.), reviewing the activities of the Federation, said that its teams were among the first to go to Germany at the beginning of November for the purpose of ear-marking plant for reparation claims, and claims for German plants were submitted to the Government on behalf of the industry by the end of last year. Other teams had been, or were about to go, to Germany to investigate processes both in the material and moulding branches of the industry. Referring to the suggestion that the industry should establish a testing station, he said that the work done by such a station would be both complementary and supplementary to the research work already carried out by a number of members, but it would need the wholehearted support of the industry if it were to be successful. After consulting the Groups, the Council came to the conclusion that there was barely sufficient support to warrant proceeding further at the moment, but it had the matter still under consideration.

Mr. H. V Potter (Bakelite, Ltd.) expressed members' appreciation of the services rendered to the industry by the chairman during his term of office, to which the chairman briefly replied.

At the close of the meeting, a presentation was made by the chairman to Mr. M. P. MacFarlane, who was retiring from the position of of hon. treasurer which he had held continuously since the formation of the British Plastics Moulding Trade Association, the forerunner of the present British Plastics Federation, in 1930.

At the first meeting of the new Council, following the annual general meeting, Mr. W. Charles Waghorne (Insulators, Ltd.) was elected chairman of the Council and of the Federation for the session 1946-47, Mr. C. F. Merriam (Halex, Ltd.), vice-chairman, and Dr. W. J. Worboys (Imperial Chemical Industries, Ltd.), hon. treasurer.

The Federation's annual luncheon is to be held at the Savoy Hotel, London, on April 10th.

Illuminating Engineering Society

THE Birmingham Centre of the Illuminating Engineering Society was addressed by the president of the Society, Mr. H. C. Weston, on the occasion of the annual general meeting. Mr. Weston spoke on "Lighting and Health," giving some idea of the vast amount of research behind the I.E.S. Code. Lantern slides effectively demonstrated that output and accuracy of work increased almost in proportion to the increase in lighting quality and showed the results of tests carried out. Glare, he said, was still the worst offender in lighting matters.

Industry and Research

Conference Organized by the Federation of British Industries

A TWO-DAY conference organized by the Federation of British Industries and having as its subject industry and research was opened by SIR ROBERT ROBINSON (President, Royal Society) on March 27th and 28th.

Among Wednesday's papers was one by DR. C. C. PATERSON (G.E.C.) on "Conversion of the Results of Research into Production." In the first stage the scientific worker, he pointed out, had things in his own hands, but the successful following up of laboratory work in the second stage introduced many difficulties mainly due to the human element. These difficulties included that of reasonably proving the soundness of deductions, despite variables that vitiated trials, to a production personnel reluctant to permit interference with its plant; the commonest issue to decide was the relative merits of new proposals.

Replicas of production tools and methods should if possible be installed in laboratories for making early rough trials, which would give the research staff confidence. Such first-stage processes were not enough, however, to establish the reliability, uniformity and economy of a new idea and required to be supplemented by something nearer production conditions. Responsibility for the second stage was taken either by the research staff or sometimes by the factory staff with the research staff acting as consultants and helpers. The interposition of a works laboratory (often a cemetery of good proposals) between the two stages was often disadvantageous, as it deprived the research staff of opportunities for education in industrial processes and for the stimulation of ideas arising out of association with production staff. As an intermediate step for transferring research results to production, the author strongly commended the use of "try-out" units. These could be developed into pilot plants pre-producing in order to give experience with the product. The paper concluded with an account of the considerations affecting experiments with full-scale plant in which control charts had an important place.

I.E.E. President's Views

On Thursday, the I.E.E. President, DR. P. DUNSHEATH (Henley's) read a paper on "The Firm with a Research Department."

The author favoured an organization having a rigid framework for performing functions whose nature was predictable from existing knowledge and having a superimposed structure freer from restraint, which would include senior scientists not charged with specific duties who should be at liberty to investigate at the fundamental end of the scale.

The rigid framework required an administrative head having a scientific reputation as well as ability to carry his team with him and to secure acceptance within the concern of his recommendations. He advocated a nucleate system in which sections grew out of and controlled one another instead of requiring detailed individual control from the head of the department. The focal point was a central nucleus group, which would initiate research. This group would be screened from production problems and would act in liaison with external academic and industrial groups. A constant flow of workers between this nucleus and the universities and research associations, freedom of publication of results of fundamental research and close collaboration with other scientists should also be encouraged.

Link with Production Departments

Co-operation with production departments was through a process group, responsible for detailed specifications and control tests and for dealing with day-to-day difficulties, and a development group. The latter dealt with such matters as methods of meeting competition or entering a new field or fulfilling the special requirements of customers. One of its functions was the provision of small manufacturing units or even selling its own products up to the small-batch production stage.

New entrants to the research department should be given as complete a picture as possible of the work of the organization as a whole as well as of the research unit. A photographic section was an invaluable asset and the library should be generously equipped.

That the present abnormal demand for plant, entailing the repetition in many instances of 1939 standards, would be dissipated during the next four years, after which competition (especially for export) would be very keen, was the immediate point of Mr. C. H. DAVY'S (Babcock & Wilcox) paper on "Modernization of Processes and Plant." This would necessitate, the speaker said, intensive application of research towards the production of entirely new designs and methods.

Since research production staffs lived in different worlds, men were required with the training and experience requisite to provide a bridge between the two—a point that appeared to be more fully appreciated in the United States. Much of the success of a research department would depend upon its having an intimate knowledge of the difficulties that beset designers and production men; this would be aided by frequent meetings of a committee composed of those actively engaged in these branches. Research workers should have freedom of access to workshops and sites where full-scale erected plant was put into operation.

PERSONAL and SOCIAL

News of Men and Women of the Industry

AS announced last week, **Mr. J. S. A. Bunting** has been appointed managing director of Edison Swan Cables, Ltd. Mr. Bunting, whose photograph we reproduce, has been with W. T. Henley's Telegraph Works Co., Ltd., for twenty-seven years, the last eight as sales manager of the company, not sales engineer as stated in our last issue.

Mr. J. S. A. Bunting

The March dance of the London Students' Section of the I.E.E., held at the Oak Restaurant, Kensington, on March 16th, proved a very pleasant function, about 300 members and friends attending. Several novel dances were arranged by the entertainments secretary, Mr. G. Lyon. Amongst the guests were Dr. Percy Dunsheath (president), Mrs. Dunsheath, Mr. W. K. Brasher (secretary) and Mrs. Brasher.

To celebrate his silver jubilee with Hoover, Ltd., **Mr. H. F. Bunn,** general sales manager, was recently entertained at a dinner at the Russell Hotel. Mr. C. B. Colston, C.B.E., chairman of the company, presented him with a cocktail cabinet and a television set, given by the firm, and a cheque from the directors.

Mr. F. H. Schroeder, a director of Lancashire Dynamo & Crypto, Ltd., has now arrived back in this country from a three months' tour of India and Ceylon, visiting the company's agents.

Lt. Col. C. R. Westlake, who, as announced elsewhere in this issue has been appointed to lead a mission to investigate electrical power developments in East Africa, has had considerable experience in the development of electricity supply in this country. He was responsible as the first county electrical engineer for the design of the electrification scheme for Dumfries-shire and also for the setting to work of the necessary organization together with the formulating of the tariff systems. After this he became the first chief engineer and manager of the Electricity Board for Northern Ireland. Lt. Col. Westlake is now general manager and engineer of the Finchley Corporation Electricity Department.

Mr. R. F. Hatto, sales director of S. Wolf & Co., Ltd., is on a visit to Canada and the United States to examine and discuss the future possibilities for the sale of portable electric tools there.

Mr. James Martin, Associate I.E.E., has recently relinquished his position of technical adviser, East Midland Territory, with the Benjamin Electric, Ltd., to take charge of the Thorn Electrical Industries, Ltd. Illuminating Engineering Department for the Northern Area, operating from the new Manchester offices.

Mr. H. Jack, chief electrical engineer, **Mr. A. A. Pollock,** chief mechanical engineer, and **Mr. L. J. Davies,** head of the Research Department, have been appointed directors of the British Thomson-Houston Co. Ltd.

Mr. Leslie G. Toplis, sales manager to the Victoria Instrument Co., Ltd., is leaving that company at the end of March to become a partner in the firm of Toplis, Simpson & Co., which will act as selling agents for the Victoria Instrument Co. His address will still be at Victoria Works, Midland Terrace, Victoria Road, N.W.10.

Mr. J. C. Welburn, who has been elected president of the Electrical Power Engineers' Association for 1946, is chief draughtsman to the Harrogate Corporation Electricity Department. He was educated at Bowerham School and Storey Institute, Lancaster, and held various positions in both civil and mechanical engineering before entering the electricity supply industry. In 1923 he left the Post Office Engineering Department to take up an appointment with Lancaster Corporation Electricity Department. He joined the Harrogate Corporation Electricity Department in 1927 at the time of the change-over from single- to three-phase and the extension of the area of supply with consequent rural electrification development. Mr. Welburn has been a member of the E.P.E.A. for many years and has served on all its major committees. For three years he was chairman of the West Yorkshire Section, and in 1939-40 was chairman of the Northern Divisional Council.

Mr. J. C. Welburn

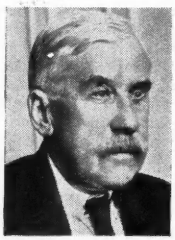
Among the guests at the first annual dinner of the South Staffs Branch of the Electrical Contractors' Association were the Mayor and Mayoress of Walsall, Alderman Cartwright, chairman of Walsall Electricity Committee, Alderman Tibbetts, J.P., past chairman of the Committee, Mrs. Crabtree (Electrical Association for Women) and Alderman Lewis (Electrical Trades' Union). The principal guest, Mr. E. A. Newburn, engineer and manager, Walsall Electricity Department, was prevented by illness from attending; his reply to the toast of the

guests being read by Alderman Tibbetts. Mrs. Newburn was asked to convey to her husband the best wishes for his speedy recovery and for his future happiness and prosperity in his new appointment as chief engineer at Bath. The toast of the Association was proposed by Mr. G. Heathcock (Midland Electric Corporation) and responded to by Mr. J. G. Briggs (vice-president). Entertainment was provided by Miss Winifred and Mr. Albert Groves, and the branch vice-chairman, Mr. Birch. The function was organized by the Social and Entertainments Committee of the branch. Messrs. W. G. France, chairman, W. E. Birch, vice-chairman, C. Brady, branch secretary, H. Smith and H. F. Truman.

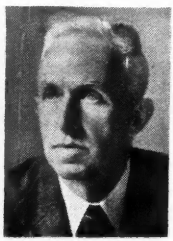
Capt. A. J. Hemming, R.E., A.M.I.E.E., has just been demobilized and will take up his new appointment as consumers' engineer to the Coventry Electricity Department early next month. After holding appointments with various electricity supply companies, Captain Hemming was from 1926 to 1939 with the Portsmouth Electricity Department. He served with an R.E. workshop unit in Egypt and Greece from 1939-41, when he was taken prisoner. Since his return to this country he has been with the Inspectorate, Electrical and Mechanical Equipment, Ministry of Supply.

Mr. R. G. Mattocks, who has recently returned from war service, has been appointed assistant electrical maintenance engineer to the Coventry Corporation electricity undertaking.

Lord Queenborough, who is eighty-five, has retired from the chairmanship of Siemens Brothers & Co., Ltd., and will be succeeded by **Dr. H. R. Wright,** who also retains his position as managing director. **Mr. F. A. Lawson,** chief of the company's Patents Department and a director of Siemens Electric Lamps & Supplies, Ltd., has been appointed a director of the company.



Lord Queenborough



Dr. H. R. Wright

Mr. F. A. Lawson

Mr. G. E. J. Smith, A.M.I.E.E., purchasing officer to the London and Home Counties Joint Electricity Authority, is retiring in April. Mr. Smith obtained his mechanical knowledge with the Blenheim Small Arms and Engineering Works, London, leaving there to spend two years with Veritys, Ltd. He then joined Edmundsons Electricity Corporation, being assistant engineer to the Folkestone Electricity Supply Co., after which he became chief assistant engineer with the Guernsey Electric Light & Power Co., and later engineer and manager of the Urban Electric Supply Co., Ltd. He was at Dartmouth generating works from 1902 to 1926 and in addition at Newton Abbot generating works from 1907 to 1923, at which date the Newton Abbot undertaking was transferred to Torquay Corporation. During the 1914-18 war Mr. Smith was with the Coal Control, Western Area. He became assistant engineer to the London & Home Counties Joint Electricity Authority in 1928, and was appointed purchasing officer in 1935. Mr. Smith, who is now seventy, has spent more than fifty years in the electrical industry.

Major J. McFetridge, A.M.I.E.E., formerly of the Air Ministry, English Electric Co., Ltd., and Sir W. G. Armstrong Whitworth & Co., Ltd. (Diesel Traction Department), has returned to England for release from military service. His address is c/o Lloyds Bank, Ltd., Grey Street, Newcastle-on-Tyne.

Lt. Col. W. J. L. Cope, R.E., whose daughter, Miss Jean Cope, has (as reported last week) just been awarded a Caroline Haslett Trust Scholarship, has now returned from service in India as a C.R.E., and has resumed his position as chief engineer to the British American Tobacco Co. His friends will regret to learn of the recent loss of his son.

The Council of the Illuminating Engineering Society has made the following nominations of officers for the 1946-7 session:—President: Mr. J. S. Dow; vice-presidents: Messrs. J. M. Waldram, N. V. Everton and J. S. Preston; hon. treasurer: Mr. Percy Good; hon. secretary: Mr. H. C. Weston.

Dr. R. C. G. Williams, general manager of the new Electronics Division of Murphy Radio, is severing his connection with the company, at least for the time being, for the purpose of obtaining experience of technical and industrial aspects of radio and electrical engineering on the other side of the Atlantic. The management of the Electronics Division will be taken over by **Mr. K. S. Davies.**

Mr. Loughnan St. L. Pendred, C.B.E., editor-in-chief of *The Engineer,* is retiring on April 1st after fifty years' service with the journal. He succeeded his father as editor in 1905, when he was thirty-five. Mr. Loughnan Pendred is a past-president and an honorary member of the

Institution of Mechanical Engineers. He is succeeded in the editorial chair by his second son, **Mr. Benjamin Pendred,** and **Dr. T. W. Chalmers,** chief technical assistant to the editor since 1932, has been appointed consultant editor of the Journal.

Mr. H. H. Harley, has been re-elected president of the Gauge & Tool Makers' Association for the ensuing year.

Mr. Walter J. Cooper, late of A. C. Cossor, Ltd., has been appointed purchase manager to the Harland Engineering Co., Ltd., and will operate from the main works at Alloa.

Consequent upon taking up an appointment in Leeds, **Mr. C. F. Huebner** is relinquishing the position of honorary secretary of the London branch of the Association of Mining Electrical and Mechanical Engineers, and **Mr. B. H. Morgans,** c/o T. & W. Morgans, 6, Laurence Pountney Hill, London, E.C.4, has been elected to succeed him.

Mr. A. N. Bott has been confirmed in the appointment of county electrical engineer of Kirkcudbrightshire at a salary of £850, with cost of living bonus.

Mr. John Sumner, Assoc. M.C.T., A.M.I.E.E., senior mains assistant engineer with Wolverhampton Corporation Electricity Department, has been appointed chief assistant electrical engineer with Mansfield Corporation Electricity Department.

Mr. C. A. Hopkins, general manager of Sunderland Corporation Transport Department, has been nominated as president of the Municipal Passenger Transport Association.

Mr. John C. Williams, of Cardiff, has been appointed mains superintendent to Rawtenstall Corporation Electricity Department.

F/O A. J. Caig has rejoined the St. Helens Cable & Rubber Co., Ltd., and will resume his duties as electrical representative from its new depot at 35, Victoria Street, Liverpool

Obituary

Mr. O. R. H. Bury.—We regret to report the death, on March 21st, of Mr. Oliver Robert Hawke Bury, who until recently was chairman of the London Power Co., Ltd., and the London Electric Supply Corporation, Ltd. Mr. Bury was eighty-four years of age.

Mr. W. P. Whitehouse.—We regret to record the death on March 20th, of Mr. W. P. Whitehouse, works manager, Southern United Telephone Cables, Ltd. Mr. Whitehouse, who was sixty-three, spent his early days with Callender's Cable & Construction Co., on installation work in England and abroad, later working in Canada for the Northern Electric Co., Montreal. He served in the Canadian and British Forces throughout the 1914-18 war, afterwards joining W. T. Henley's Telegraph Works Co., Ltd., Gravesend. In 1932 he was appointed production officer to Southern United Telephone Cables, Ltd., Dagenham Dock, later becoming works manager.

Mr. C. J. Beaver.—The death on March 20th of Mr. Charles James Beaver, M.I.E.E., has deprived the cable-making industry of an outstanding personality. For nearly fifty years he was responsible for the design of the various types of insulated electric cables and accessories manufactured by W. T. Glover & Co., Ltd., and in addition to being the company's chief engineer, he was an executive director from 1924 until his retirement last year. As long ago as 1905 he joined the late Mr. Ll. B. Atkinson in an I.E.E. paper entitled "Some Points on the Selection of Electric Cable." He was the author of a number of other papers and frequently contributed to the electrical press. In 1914 he was awarded an I.E.E. Premium for his paper on "Cables" and he was chairman of the Manchester Section of the Institution in 1917.

The late Mr. C. J. Beaver

Mr. Beaver's book on "Insulated Electric Cables" published in 1926 is still regarded as a classic. Ten years later he was awarded the Colwyn Gold Medal by the Institution of Rubber Industry for "scientific work in connection with the application of rubber in the cable industry." In addition Mr. Beaver introduced many improvements and patents in the design of cables, cable-making machinery and lead presses for sheathing cables. His more recent researches were largely concerned in the design of 132-kV gas-filled, non-bleeding paper-insulated cables. In collaboration with Mr. E. L. Davey, a paper was presented to the I.E.E. in 1943 entitled "The High Pressure Gas-Filled Cable" for which the authors were awarded the Institution Premium.

Mr. F. H. Downie.—The death occurred on March 20th of Mr. Frederick Habler Downie, O.B.E. (Mil.), B.Sc., M.I.E.E., who served in the Ministry of Supply during the war.

Mr. L. O. Cox.—The death occurred recently of Mr. Leonard Owen Cox. He was formerly mains superintendent in the Leyton Electricity Department with whom he served for over forty years, retiring in 1944 through ill-health.

Mr. R. Milward Ellis, director of Pye, Ltd., since the incorporation of the company in 1929, died recently.

Will.—**Mr. S. H. S. Cook,** a director of the Northampton Electric Light & Power Co., Ltd., and the Wellingborough Electric Supply Co., Ltd., left £3,522 (net personalty £3,436).

Servo Systems

Value of "Standard Forms"

A THEORETICAL account of some of the salient factors relating to the design of servo systems, which may be termed error-actuated or closed-cycle methods of automatically regulating speed, voltage, mechanical tension, remote gun operation, etc., is given in a paper presented by Dr. A. L. WHITELEY (British Thomson-Houston Co., Ltd.) to the Measurements Section of the Institution of Electrical Engineers.

The author is mainly concerned with the achievement of an adequate degree of stability, lack of which is shown to be chiefly due to response time-lags within the system and basic control characteristics. He describes methods of suitably modifying the system performance.

To facilitate calculations and permit of the ready determination of constants of the added stabilizing networks "standard forms" are proposed, corresponding to linear differential equations up to the sixth order. The forms are not claimed to be of universal application, but they have been found to apply to widely different electric servo systems.

Discussion

In the ensuing discussion PROFESSOR K. A. HAYES (Military College of Science) said that during the war tremendous problems faced the designers of servo-mechanisms for guns and searchlight control and in many cases it was necessary to control loads of many hundreds of tons with very great accuracy. Numerically, there were more pneumatic control systems at the moment than electrical and he suggested that the whole subject of servo-mechanisms was worthy of inclusion in the higher technical courses and post-graduate courses and research should be undertaken seriously by one or more of the universities. Courses were already being arranged in different parts of the country.

DR. A. PORTER (Ministry of Supply) said that the difficulty of control with industrial systems was far greater than with position control, such as gun control. For instance, in the control of chemical reactions involving the use of steam, there were variations of steam pressure and temperature to be dealt with.

MR. L. JOFEH (A. C. Cossor, Ltd.), who said he had been associated with the author in this work, pointed out that this contribution was particularly valuable because it gave "standard forms" for various types of control systems which were not merely satisfactory in theory but also in practice.

MAJOR W. H. MADDISON (Post Office) thought it unlikely that one individual firm would ever be able to provide the complete equipment to give the optimum performance. Components would have to be made by different firms and therefore it was necessary to have some means for specifying the performance of each component, which was not an easy matter.

MR. T. G. BARBER (Admiralty) said that in his department, the electric servo gave better results in error performance, but its velocity performance was not so good as that of the electro-hydraulic system. For heavier work, in order to get better performance, use had been made of transient voltage feedback, which was a useful method of overcoming the backlash effect.

MR. T. H. BELSEY (Metropolitan-Vickers) said a colleague and himself had developed a system known as "divided re-set," which overcame the effect of backlash. The re-set was taken partly from the motor and partly from the load and overcame the effects of resilience and/or backlash between the motor and the load.

MR. H. J. ANDREWS (L.M.S., Derby) said that in many practical applications what was really required was that the output of the machine should be regulated in accordance, not with its actual input, but with what it ought to be. In the mobile testing unit on the L.M.S. Railway, for the design of which the author was responsible, the speed of the train was regulated to approximately 0·1 mile per hour as measured by an independent vehicle through the medium of electronic control. Such a system was extremely prone to oscillation. There were three forms of hunting that made it extremely difficult to measure accurately, but by following a certain method there had so far not been a case of a single coupling breaking.

The author briefly replied.

Radiolocation Convention

THE object of the convention which has been held at the Institution of Electrical Engineers in London this week was to provide an opportunity for British scientists to place on record, as a whole, the parts they have played individually in the birth and wartime development of entirely new short-wave radio and radar systems. The proceedings commenced on Tuesday afternoon and end this evening. The convention has been divided into sessions, each concerned with a particular aspect of the subject. In each case one or two main integrating papers were followed by a number of supporting (short) lectures reviewing in more detail different elements of the sectional subjects. Some 168 contributions have been made, which it is hoped to summarize briefly in our next issue.

Overseas Electrical Trade

Substantial Rise in February Exports

THE February Board of Trade returns relating to overseas trade show that electrical exports rose sharply in value as compared with the corresponding month of last year and were substantially above the monthly average for 1938. We have compiled Table I from the returns to show the values of the principal items, and figures of imports are also given. Imports it will be seen were very much lower than in February, 1945, but they were still well above the 1938 monthly average and 1938 was not a bad year.

There were few items in which exports were lower in February than in 1945, the result that cable exports as a whole increased from £391,097 in February, 1945, to £614,988 last month (1938 monthly average £359,881.) The principal destinations of non-submarine telegraph and telephone cables were South Africa and New Zealand. British India was the chief customer for other classes of cable, South Africa being next in order. Unspecified foreign countries were responsible for a rise rom £32,534 to £195,777 in their purchases of all classes of cables.

Shipments of radio apparatus, exceptionally, were greater to foreign than to Empire countries, although the largest single

TABLE I.—ELECTRICAL EXPORTS AND IMPORTS

Class	Exports			Imports		
	Feb., 1946	Feb., 1945	Monthly Av., 1938	Feb., 1946	Feb., 1945	Monthly Av., 1938
	£	£	£	£	£	£
Telegraph and telephone wires and cables, submarine	15,343	64,876	17,289			
Ditto, not submarine	104,697	192,566	71,803			
Wires and cables other than telephone and telegraph, rubber insulated	203,751	80,723	117,533	9	72,846	31,246
Ditto, insulation other than rubber	291,197	52,932	153,256			
Radio apparatus	301,518	123,297	149,593	805,604	1,333,630	75,160
Telegraph and telephone apparatus other than radio	345,512	175,810	242,716	75	124,585	9,243
Electric carbons, furnace	*	*	*	1,320	481	4,054
Other electric carbons	*	*	*	5,137	3,668	2,301
Electric lamps	115,192	38,999	49,440	53	49,013	10,265
Other lighting apparatus	128,221	20,774	48,565	584	27,216	38,662
Primary batteries	37,206	12,224	13,572	23	22,983	3,549
Accumulators, portable	75,306	50,776	28,874	*	*	*
Ditto, stationary	4,602	2,457	19,773	*	*	*
Ditto, parts and accessories	55,113	11,394	*	*	*	*
Electric cooking and heating apparatus	68,715	8,529	30,664	*	*	*
Commercial electrical instruments, including ammeters, voltmeters, etc., and parts	36,201	15,156	15,878			
House service meters	35,656	5,645	15,791	16,375	22,944	32,057
Other electrical instruments	34,898	4,374	9,612			
X-ray apparatus, vacuum tubes and parts	21,905	5,451	4,881	6,692	37,132	9,734
Insulating materials, not elsewhere specified	81,498	20,833	19,343	*	*	*
Unclassified electrical goods and apparatus	212,428	87,567	110,615	14,225	297,149	42,630
Generators, complete, up to 200 kW	31,309	24,749	38,071	*	*	*
Ditto, over 200 kW	19,968	50,852	119,079	*	*	*
Ditto, parts	45,073	†	†	*	*	*
Motors	219,550	136,773	145,045	4,174	8,116	26,033
Convertors and transformers	159,889	150,779	101,304	*	*	*
Rectifiers for power-house use	4,991	1,110	3,463	*	*	*
Motor starting and controlling gear	57,666	20,085	50,866	*	*	*
Switchgear and switchboards other than telegraph or telephone	157,972	164,872	184,533	*	*	*
Other electrical machinery	39,869	85,648	15,497	7,437	276,085	14,455
Electric vacuum cleaners	28,015	1,193	26,662	130	—	7,519
Other electrically-operated portable appliances	21,308	1,679	10,394	1,067	7,821	17,108
Total	2,954,209	1,612,123	1,814,112	862,905	2,283,669	324,016

* Not separately classified. † Parts included in foregoing figures.

most notable being telegraph and telephone cables and unenumerated machinery. On the other hand there were much heavier exports of cables of other classes with the customer was British India. Norway and the Netherlands were the largest foreign buyers. As regards telephone and telegraph apparatus, South Africa took something over

a quarter of the total, with Australia and British India second and third. Of this class over £122,000 worth went to unspecified foreign countries, but none is shown for Russia.

Table II shows the distribution of exports of electrical goods and apparatus as a whole and it will be observed that the leading customer in February was South Africa,

TABLE II.—DISTRIBUTION OF EXPORTS OF ELECTRICAL GOODS AND APPARATUS

Destination	Feb., 1946	Feb., 1945	Monthly Av., 1938
	£	£	£
Eire	96,466	10,670	37,562
Channel Islands ..	24,471	—	11,965
Palestine	78,183	3,924	8,371
British West Africa	37,470	25,727	12,864
Union of South Africa	358,309	135,992	157,602
Southern Rhodesia	23,700	6,493	9,574
British East Africa	16,134	47,491	7,830
British India ..	319,419	97,127	122,928
British Malaya ..	8,221	—	32,280
Ceylon	7,704	2,050	14,931
Hong Kong ..	2,625	—	12,874
Australia	143,250	255,503	196,823
New Zealand ..	158,146	156,909	95,851
Canada	6,520	15,502	12,482
British West Indies	27,405	5,696	12,887
Other British Countries ..	69,238	18,939	26,336
Soviet Union ..	—	43,216	36,780
Finland	19,354	—	5,824
Sweden	38,396	406	13,735
Norway	50,043	—	12,582
Denmark	20,908	—	18,282
Poland	30,830	—	9,626
Netherlands ..	48,352	—	20,190
Belgium	68,850	2,994	10,874
France	50,816	157	15,674
French West and Equatorial Africa	4,206	2,196	400
Switzerland ..	13,885	734	3,572
Portugal	78,015	7,393	6,498
Portuguese East Africa	2,503	412	6,924
Spain	56,942	70	3,808
Italy	331	6,298	5,659
Czechoslovakia ..	173	—	7,205
Yugoslavia ..	—	—	1,471
Greece	3,349	—	4,888
Roumania ..	—	—	13,350
Turkey	2,447	10,865	7,633
Egypt	70,852	33,539	12,872
Iraq	10,351	15,453	5,456
Iran	20,175	35,715	16,330
China	3,660	1,605	4,042
United States of America ..	8,714	10,197	5,546
Chile	1,300	—	6,635
Brazil	9,143	6,603	11,123
Argentina ..	37,087	377	45,387
Other Foreign Countries ..	141,016	14,130	33,672
Total ..	2,168,959	974,383	1,119,200

with British India a fairly close second. Australia, which was the largest buyer of electrical goods in February last year fell to fourth place. It is interesting to see that Portugal headed the list of foreign buyers and that Spain also took a substantial quantity of goods. Egypt was not far behind and Belgium closely followed. Nothing is shown for the Soviet Union.

Machinery exports were mostly shipped to Empire countries, leading items being generators for Australia (£32,912), motors for British India (£67,564), and "other descriptions" for British India (£121,183) and South Africa (£88,906.)

The greater bulk of imports of electrical goods and apparatus in February came from Canada (£794,067 out of a total of £850,097.) The contribution of the United States fell from £1,677,440 in February, 1945, to £42,112. It will be seen that radio apparatus accounted for over 93 per cent. of the electrical imports.

Forthcoming Events

Monday, April 1st.—*Newcastle-on-Tyne.*—Royal Station Hotel. I.E.E. North Eastern Centre. Annual general meeting, to be followed by an informal conversazione, attended by Dr. P. Dunsheath.

Birmingham.—Technical College, Suffolk Street, 6 p.m. I.E.E. South Midland Centre. Faraday Lecture, "Atoms, Electrons and Engineers," by Dr. T. E. Allibone.

Tuesday, April 2nd.—*Coventry.*—Electricity Showrooms, 6 p.m. Coventry Electric Club. "Television," by C. H. Crocker.

Manchester.—Engineers' Club, Albert Square, 6 p.m. I.E.E. North-Western Centre (Measurements Group). "Theory of Servo Systems," by A. L. Whiteley.

Leeds.—Electricity Department, Whitehall Road, 6 p.m. I.E.E. North Midland Centre. "Three-phase Distribution and Electric Welding and Furnace Loads," by A. Langley Morris.

Thursday, April 4th, and Friday, April 5th.—*London.*—Institution of Electrical Engineers, 5.30 p.m. each day. I.E.E. ordinary meeting. Symposium of papers on Degaussing.

Friday, April 5th.—*London.*—Connaught Rooms, Kingsway, 6 p.m. Association of Supervising Electrical Engineers. Annual dinner.

Birmingham.—Imperial Hotel, 5.30 p.m. Illuminating Engineering Society (Birmingham Centre). "Post-War Street Lighting," by Dr. S. English.

Monday, April 8th.—*Cardiff.*—Institution of Electrical Engineers. I.E.E. Western Centre. "Operational Maintenance and Testing of Overhead Lines and Associated Outdoor Equipment on A.C. Systems," by R. C. Hatton and J. McCombe.

Tuesday, April 9th.—*London.*—South East London Technical Institute, 8 p.m. Electrical Engineering Society. "Structure of Matter," by E. L. White.

Institution of Electrical Engineers, 3 p.m. Institute of Petroleum. General discussion. "Transformer Oil."

Manchester.—College of Technology, 7.30 p.m. I.E.E. North-Western Centre. Faraday Lecture, by Dr. T. E. Allibone.

COMMERCE and INDUSTRY

Supply Workers' Wages. Mission to East Africa.

Electrical Workers' Bonus Increase

AN increase from 7d. to 8d. per hour in the war bonus paid to workers in the electricity supply industry, to take effect as from the commencement of the first full pay period following March 21st, has been approved by the National Joint Industrial Council for the industry. The increase applies to all zones and will be reckoned in calculating overtime. In the absence of specific provisions dealing with the adjustment of the wage variations of apprentices, probationers or juniors, the bonus to be applied to these grades shall be such an amount as will maintain their present percentage relationship to the adult rate for the appropriate grade. This recommendation was coupled with a " gentlemen's agreement " to negotiate a national agreement for wages and conditions in the provinces without undue delay.

The enhanced rate for shift workers provided for in Clause 3 of the National Agreement of January 15th, 1943, and in Clause 5 of the National Switchboard and Substation Attendants, etc., Agreement of March 23rd, 1944, is to be amended to read as follows:—Rotating Shift Workers: (a) If working on Sundays but not on nights, 1½d. per hour; (b) If working on nights but not on Sundays, 1½d. per hour; (c) If working on both nights and Sundays, 3d. per hour. Alternating Shift Workers: (a) If not working on Sundays, 1½d. per hour; (b) If working on Sundays, 3d. per hour. Clause 7 of the January, 1943, agreement is deleted.

Power Engineers' Conditions

The National Joint Board of Employers and Members of Staff (Electricity Supply Industry) has agreed that the provisions of Clause 12 of the National Agreement (relating to bank holidays) shall apply to December 24th, 1945 (or in Scotland December 31st, 1945). This means that an employee who was required to work or be available for duties on these days shall be entitled to be relieved from duty for a period equal to the time worked and not less than half a day. If a shift worker's normal day off fell on these days he is entitled to a day off in addition to the bank holiday.

The following addition has been made to Clause 39 of the Agreement (" Increments to be maintained on reduced classification "):—" An employee in a station, substation, or undertaking which is raised to a higher class being a class from which it had previously been lowered, shall have his previous service in the higher class added to his service in the lower class when determining the column to which he shall be allocated in the higher class."

Coal Transport Charges

The Parliamentary Secretary to the Ministry of War Transport has informed the Liverpool Electric Power & Lighting Committee that the Minister cannot make an exception in favour of Liverpool in respect of the charges for the use of hopper bottom wagons during the war. The Ministry requisitioned 360 20-ton wagons and paid a rental of 1s 4½d per wagon per day, but the Corporation has had to pay the railways 3s per wagon for the use of its own equipment. The Electric Power & Lighting Committee is making a further protest to the Ministry.

Battery-driven Tea Trolleys

A strong believer in electrification, the Southern Railway has just adopted a new application of electricity by putting into service at Waterloo Station an electric battery-driven tea trolley, the first of several to be supplied for this and other stations. Made by E.

The first of the Southern Railway's new battery-driven tea trolleys

Pashley & Son, Ltd., of Aston, Birmingham, the trolley is intended for use on platforms for supplying tea, ices, pies, sandwiches, cakes, etc. It will operate for five days on a charge and is provided with a brake, but no reversing gear. Exide batteries are fitted, with Leggatt's control gear. The tea is kept in four 3-gal. thermo-urns, which will keep hot for five hours and are sufficient to serve nearly three hundred cups, the correct amount of tea, milk and sugar being poured out automatically by simply operating a lever. The trolley, which has an illuminated top, is attractively finished in peach-coloured plastic and chromium.

Tax Relief Advocated

Suggestions for the reduction and simplification of taxation have been made to the Chancellor of the Exchequer by the Engineering Industries Association. It is considered that in spite of the difficulty involved an attempt should be made to consolidate and codify existing income tax laws and to expedite assessment of liability to income tax. It is contended that in view of the stringent conditions attached to the

refund of excess profits tax it is illogical that post-war refunds should be subject to income tax and surtax. Moreover it should be possible to use these refunds for providing additional working capital for a business. The Association expresses doubt whether the calculation of the ultimate allowances for exceptional depreciation by reference to a valuation to be made at a date to be fixed by Parliament will give adequate relief.

Middlesbrough Protests to E.D.A.

The Middlesbrough Corporation has protested to the British Electrical Development Association against its dismantling the exhibition kitchen which was being shown in various parts of the country. The borough electrical engineer (Mr. H. Haigh) had been planning to arrange the exhibition at Middlesbrough, but was told by the Association that the kitchen had been dismantled because the Ministry of Supply wanted to borrow it for an. exhibition of its own. Mr. Haigh has informed the Corporation that the Association's reason was not adequate. Its first duty was to its members and their consumers. It was not reasonable to suppose that the Association had done its duty to the Middlesbrough area by holding an exhibition at Newcastle-on-Tyne. The number of people from Middlesbrough who had seen the exhibition must have been negligible.

Coal Direct to Power Station

A £4,500,000 colliery reconstruction scheme by Manchester Collieries, Ltd., includes the construction of a 450-yd long tunnel to carry coal on a conveyor direct from the coal face in Bradford Pit to the Manchester Corporation's power station. It is claimed that this scheme would be the first of its kind in the country and that coal could be delivered at the rate of 200 tons an hour.

Adoption of International Units

In 1935-37 the International Committee of Weights and Measures decided that on January 1st, 1940, the system of absolute units (electric) would be replaced by the international units, and also the c.p. unit in photometry and the heat unit (calorie) to be equal to $_{8}\frac{1}{6}_{0}$ watt-hours. The changes did not take place on that date, but a meeting of the Committee at Sevres under the chairmanship of Mr. Sears (Great Britain) has now proposed that they shall come into force on January 1st, 1947, subject to confirmation at the official Committee meeting in October next.

Cossor Strike Ended

After a meeting between representatives of the workers and management at the Cossor factory at Highbury on Thursday last week, it was announced that work would be resumed unconditionally the following morning.

Building Registration and Licensing

Since October, 1941, there has been a Register of Building and Civil Engineering Contractors (which has included electrical contractors). Certificates have been granted as a right in certain cases; in others they have been granted at the discretion of the Minister of Works. Now the control over admission to the Register has been discontinued and in future no application for a certificate of registration will be refused except where a certificate previously granted has had to be revoked or where the applicant has been convicted of an offence against the licensing regulation and the Court has recommended the Minister to refuse the application.

This Court recommendation is one of the new measures introduced to prevent the carrying out of unlicensed work or work in excess of the amount licensed. Much heavier penalties are to be imposed upon those who infringe the Regulation—fines up to £5,000 or three times the cost of the work, whichever is greater, and penal servitude up to seven years.

It is still necessary for a person who wishes to set up in business as a building or civil engineering contractor to be registered with the Ministry of Works and to give an undertaking that the terms and conditions of his employees shall be neither more nor less favourable than those fixed by joint agreement in the industries or by arbitration. The Minister reserves power to revoke the certificates of those not observing this undertaking.

Ex-Service Electricians

Following the decision announced in November last, the Electrical Trades Union has set up a "Resettlement Section" to which will be admitted men who have received electrical training in the Forces. It is stated that every encouragement will be given to these men to become fully-skilled tradesmen and they will be given full membership at the end of twelve months if they have become sufficiently qualified. Those in the Resettlement Section will enjoy full trade union protection but lower contributions and benefits will apply to them.

Collier Lost

At this week's meeting of the Fulham Borough Council it was reported that the *s.s. Fulham VII* was lost on February 14th as the result of a collision with the American steamer, *Alfred Victory*, off Beachy Head, resulting in the deaths of Mr. M. Smith, chief engineer, and Mr. A. Jackson, the donkeyman. An order has been placed with the Burntisland Shipbuilding Co., for a new collier at an estimated cost of £135,000.

Lochaber Company's Appeal

The Valuation Appeal Court has given judgment in an appeal on behalf of the Lochaber Power Co. against decisions of the Valuation Committee for the Lochaber District of Inverness-shire. The company's hydro-electric power works was constructed in three stages. The first two, which included a tunnel under Ben Nevis, were completed by 1934. The work on the third stage was carried out between 1940 and 1944. In valuing the undertaking on the contractors' principle, the Assessor took the actual cost of the works comprised in the first two stages, but as regards the third stage he made a deduction of 33⅓ per cent in respect of the sharp rise in prices during the war. To the figures thus ascertained he applied 5 per cent to land and civil engineering works, and 7 per cent to buildings and machinery.

The appellants unsuccessfully maintained

before the Valuation Committee and also contended before the Appeal Court that a general reduction of 20 per cent should be made from the actual cost of the works comprised in each stage, and that as regards the third stage the 33⅓ per cent should be applied to the figure so reduced. They further contended that only 4 per cent should be applied to the civil engineering works, or alternatively, to that portion consisting of the Ben Nevis tunnel.

The Court rejected the contention that a deduction of 20 per cent from current prices was in accordance with a rule of practice laid down, or at least sanctioned, by the Court, but held that the case was one in which some modification should be made of a strict application of the contractors' principle. They therefore allowed a deduction of 20 per cent from £1,853,949, the cost of the tunnel, leaving the percentage to be applied to the cost of the civil engineering works, reduced by such deduction, at 5 per cent, and by allowing a deduction of 50 per cent from the actual capital cost of the pier of £92,571, before applying the 7 per cent.

Electrical Development in East Africa

The Secretary of State for the Colonies is sending a mission of civil and electrical engineers, under Lt. Col. C. R. Westlake, to East Africa to carry out investigations in connection with electric power developments in Kenya Colony, Uganda Protectorate and Tanganyika Territory. Their duties will be to investigate the potential demands for electric power for industrial, mining, agricultural and other purposes in the East African Territories; to examine the water power and fuel resources in the East African Territories with a view to their development; to prepare a report indicating the extent to which electric power facilities should be made available and the extent to which a demand for electric power is likely to be made for industrial undertakings, agricultural projects, etc.; to make preliminary financial estimates; and to make recommendations as to the organization required for the future development of electricity supply.

An article on the possibilities of electrification of the Kenya and Uganda Railway by G. H. Lepper appeared in our issue of November 30th (page 785).

Apprenticeships at Stockton

Consideration is being given by Stockton-on-Tees Corporation to a proposal that apprentices in the Electricity Department should be indentured. The present arrangements, it is stated, are not satisfactory. It is proposed that apprentices should be indentured for five years, or three years in the case of advanced students. Apprentices will be designated "apprentice electrical engineers."

Educational Technical Films

Crompton Parkinson, Ltd., have now made available for educational purposes their documentary film "Colonel Crompton—Pioneer and Prophet." Telling the story of Colonel Crompton the man, scientist and engineer, the film opens with his early experimental work with dynamos and arc lamps, and later he is shown working on his invention of the compound winding, which was essential to the successful utilization of the newly-introduced incandescent lamp. The story is told of how the first public supply system in this country was initiated at Kensington Court as the result of Colonel Crompton's enterprise and perseverance. Realism is achieved by a clever blending of re-enacted scenes, and "stills" of the actual early documents, apparatus and plant. The part of Colonel Crompton is played by Ernest Thesiger. The showing time is approximately 30 minutes. Applications for the film (available in both 16 mm. and 35 mm.) should be made to Crompton Parkinson, Ltd., Publicity Department, Electra House, Victoria Embankment, London, W.C.2.

W.R.N.S. Homecraft Course

For twelve weeks different groups of W.R.N.S. from the London Area have attended a Homecraft Course at the headquarters of the Electrical Association for Women. Mondays have been given over to laundry work, when the electric washing machine, drying cabinet, press iron and hand iron have been demonstrated and used by the Wrens themselves. On Tuesdays, working in pairs, they have prepared an electrically cooked lunch, and the afternoon has been devoted to cakemaking. Lectures and demonstrations on the use, care and maintenance of domestic electrical equipment have been given on Wednesdays.

Flather & Co., Ltd.

Following the purchase by Brush Coachwork, Ltd., of the assets and liabilities of Flather & Co., Ltd. (but not the shares), the latter company has now changed its name to Matina (Leeds) Investments, Ltd., and is now in process of liquidation. To perpetuate the name and goodwill, however, Brush Coachwork, Ltd., has formed a new company named Flather & Co., Ltd., with its registered office at Falcon Works, Loughborough, but still continuing its works at Beeston, Leeds, and offices at 10, Briggate, Leeds, 1.

Germany to Export Electric Vehicles

One of the new products now being made in Berlin largely with a view to export, is a 1½-ton electric vehicle with a speed of 30 km.p.h. and a radius of action of 100 km. The present production schedule calls for 2,000 to 3,000 vehicles. A 2-ton type is in preparation.—*Reuter.*

Instruction in Night Flying

Reference is now permitted to what is officially known as the "day-night flying" training scheme, described in the Air Ministry's instructional pamphlet (No. 177), which explains the method in detail. The principle is based on utilization of the monochromatic properties of light emitted by sodium discharge lamps in conjunction with special filters fitted to the pupil pilot's goggles, or the aircraft cockpit, so as to simulate darkness although the landing lights and instrument panel remain plainly visible.

Varying degrees of darkness and moonlight can be reproduced, while the pupil thus learns to fly "by night" his instructor is able to observe everything in full daylight. For each aerodrome so equipped nine portable units were required for flarepath illumination, each housing

four 140-W sodium lamps, while the 60-W size was used for lighting instrument panels in aircraft, energized from batteries in conjunction with rotary convertors. Philips Lamps, Ltd., played a major part in advisory and supply capacities in satisfying the demand for thousands of lamps and auxiliary apparatus.

Oldham Corporation to do Wiring

Oldham Electricity Committee is setting up a department for wiring and other work in consumers' premises. There was opposition to this proposed development at last week's meeting of the Committee on the ground that private firms had given excellent service in the past and had done much canvassing for the Corporation and they ought now to be protected from municipal competition. The chairman, Alderman Whittaker, replied that the Electricity Department did not desire to create a monopoly and was merely entering into competition with private firms.

Meter Company Moves to Bangor

British Electric Meters, Ltd., who have transferred their works from Lancashire to the works formerly used by the Daimler Co., at Bangor, North Wales, expect to commence production within a few days. The company will manufacture electric meters, clocks and precision instruments. By the end of six months it is hoped to employ 500 men and women.

Electric Blanket Production

Thermega, Ltd., has taken over a factory on the Hillington Estate, Glasgow for the production of electric blankets and heating pads.

Castings for Electrical Apparatus

A new foundry to be built by Merchiston Foundry, Ltd., at Falkirk, will specialize in castings for electric cookers, fires, irons, etc.

Imports into Ceylon

A revised list of goods covered by Open General Licence No. 4, issued by the Government of Ceylon, includes a number of electrical items including wires and cables, lamps, lighting accessories and fittings, batteries and accumulators (other than wireless), and electrical goods and apparatus (other than telegraph and telephone apparatus, vacuum cleaners and dry shavers).

Tin Stocks in Lower Burma

Preliminary reports received from official channels indicate that there are stocks of about 1,200 to 1,300 tons of tin concentrates in Lower Burma. Current production is negligible.

Cambridge Engineering Society

The largest number of persons ever present at any of the Cambridge and District Engineering Society's meetings attended a lecture on "Atomic Energy," given by Mr. J. Dainty, M.A., of the Cavendish Laboratories, Cambridge University. The discussion was followed by a sound film on the " Valley of the Tennessee," one showing the construction of prefabricated houses, and a third on the engineering side of Fenland.

At the next meeting a lecture entitled " The Principles and Modern Developments of Television," will be given by Mr. S. R. R. Khabanda, who has been engaged in research work on this subject for some considerable time.

Standardization

At a meeting of the London Branch of the Purchasing Officers' Association on March 11th, Mr. L. G. Watkins, secretary of the British Standards Institution, read a paper on " British Standard Specifications." He was supported by Mr. Cook, chief technical officer, B.S.I.

Trade Publications

Johnson & Phillips, Ltd., Charlton, London, S.E.7.—General export catalogue (G.6) liberally illustrating cables and accessories, cable laying gear, overhead line materials, switchgear, transformers, capacitors, instruments, welding plant and water heaters.

Electro Dynamic Construction Co., Ltd., St. Mary Cray, Kent.—Illustrated and priced lists descriptive of (No. 1 DC) d.c. motors and generators, large and small, of various types including low voltage ; (No. 2 NC) rotary convertors for neon signs, medical apparatus and fluorescent lighting ; (No. 3 RC) power equipment for radio, television, public address and electronic apparatus.

Herman Smith, Ltd., Reliance Works, Dudley, Worcs.—Priced and dimensioned folder descriptive of a patented two-piece reflector for 5-ft. fluorescent lamps; also leaflet on a distributive fitting for flush ceiling mounting.

Applicants for copies of these publications should write on their firms' business notepaper.

Calendar

A pencil sketch of the Tyne Bridge, Newcastle, illustrates the Parolle Electrical Plant Co.'s calendar, which extends to February 28th, 1947.

Trade Announcements

W. T. Henley's Telegraph Works Co., Ltd., have opened a new store at 14, Kirby Lane, Canterbury (telephone: Canterbury 3130), where a comprehensive stock of rubber-insulated wires, cables, and flexible cords, etc., will be carried. The store is under the control of Henley's Brighton branch manager, Mr. W. G. Turner, the local representative being Mr. W. R. Morley.

Barries Electrical Agencies, Ltd., King Street, Brighton, have been appointed sole agents for the home and export markets, excluding the Midlands, for Bevgree, Ltd., manufacturers of fluorescent chokes, transformers, home car battery chargers, etc.

Heating Installations, Ltd., have moved to 41-43, Westminster Bridge Road, S.E.1 (telephone: Waterloo 4242/4).

Green Electrical Industries, Ltd., are now at Limes Place, West Croydon (telephone: Thornton Heath 2978).

The Manchester branch of Siemens Electric Lamps & Supplies, Ltd., has moved to new premises at Siemens House, 92 & 94, Oxford Road, Manchester, 13 (telephone Nos.: Ardwick 4118 and 4119).

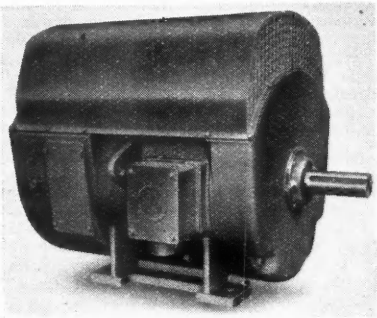
RECENT INTRODUCTIONS

Notes on New Electrical and Allied Products

Dust-protected Motors

AS an alternative to plain totally enclosed d.c. motors for dusty situations the ENGLISH ELECTRIC CO., LTD., Bradford, is offering a closed-air-circuit type.

The basic feature of its design is that of pipe ventilation, but with the addition of a surface-cooled radiator to allow continuous internal air circulation by the internal fan. The radiator



Radiator cooled motor for dusty situations

consists of a group of straight tubes secured to end plates and arranged like a saddle on top of the machine frame in such a way that while the heated air within the motor casing passes over the exterior of the tubes, a stream of cold outside air is forced continuously through the inside of the tubes by means of a second fan mounted at the non-driving end of the shaft. Accessibility of the commutator and brush-gear is unaffected, and the cooling tubes can be easily cleaned.

Household Clothes Irons

The first of a range of household "Electracraft" clothes irons to be made by BARNSHAW & CO., LTD., Mersey Street, Stockport, Cheshire, is being marketed through the Market Research & Development Association, Maranda House, Binney Street, Oxford Street, London, W.1. The standard model weighs 5·5 lb with the 0·5 in. sole-plate nickel plated and loaded at 450 W for 220-250 V. The handle is moulded and the anodized aluminium cover is finished in frosted pastel shades.

The household clothes iron now being made by FALCO ELECTRICAL APPLIANCES, LTD., Coalbrookdale, Shropshire, weighs 5 lb and is chrome-plated or enamelled in colour. A heat selector is combined with a thermostat and a pilot lamp is set in the handle, which is moulded to form a thumb rest on each side.

Both plated and coloured irons weighing 4¾ lb are available from INSTANTA ELECTRIC, LTD., 48, Old Church Street, Chelsea, London, S.W.3.

The "Lincass" iron, 5 lb and 450 W, plated or colour enamelled, is announced by H. CASSIRER, LTD., 31, Pinner Road, Harrow, Middx., home sales being conducted through the PROGRESS CABLES & ACCESSORIES CO., LTD., Regent House, Eversholt Street, London, N.W.1.

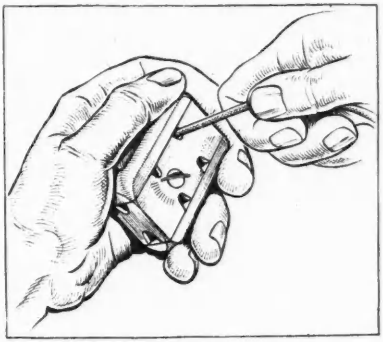
Room Heaters

A movable radiator of the sectional water-filled design is being manufactured by ALADDIN INDUSTRIES, LTD., Greenford, Middlesex. It is fitted with a 500-W immersion element and a pilot lamp, while an additional 1-kW fire-bar mounted at the centre of the radiator is separately controlled by a switch below the indicator lamp, thus being usable only when the water is being heated.

Another product is a radiant heater composed of two fire-bars arranged horizontally, one above the other, with a half-heat switch below, mounted in a tubular enamelled frame.

Cable Stripper

A cable stripping tool of unusual design is being offered by CABLE STRIPPERS, LTD., Leighton House, Potters Bar, Middx. It is made of metal alloy and of vest pocket size to be comfortably held in the palm of the left hand.



Cable stripper showing method of use

The cable is inserted in one of the four lateral V-slots, according to size; with the left thumb depressing the "floating" pressure bar at the top of the tool, the cable is slowly revolved with

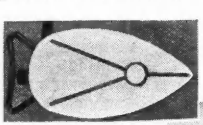
the right-hand, so making a circumferential incision in the insulation round the core. The cable is then withdrawn and, by lifting the hinged top of the tool, is re-inserted in a longitudinal V-slot; with thumb pressure on the tensioning bar, the cable is again pulled out of the tool so that the second incision is made lengthwise, thus enabling the insulation to be easily peeled off the conductor.

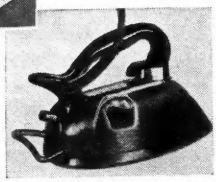
The depth of cut can be finely adjusted by means of the wing screw at the side which determines the angle of the cutting blade, of the safety razor pattern, centrally pivoted.

Steam-electric Iron

A clothes iron of much the same size and weight as ordinary household models, which can be used for both dry and steam pressing by dressmakers and tailors, is being marketed by S. LESSER & SONS (1928), LTD., 9, Cutler Street, London E.1. It is known as the a.c. "Silex," is made of burnished aluminium, being 9 in. long and 5 in. broad at the base, and is being manufactured by H. BAGOTT & CO., Pythagoras Works, Diglis Road, Worcester.

There is a switch under the shaped handle for choice of dry ironing or steaming. A screw-stopper on the right-hand side enables the body to be filled with water. The thermostat regulator, inset in the heel, is then pre-set as desired (low, medium, high) before switching on. Steam generated in the body issues through a central jet in the sole plate to three distributing grooves which radiate to the toe and each corner of the heel. Thus dry garments do not need preliminary damping and the risk of scorching is reduced. An excess-pressure safety valve is fitted and an asbestos pad is provided on which to stand the iron horizontally when steaming; when used dry it can be up-tilted on the heel rest in the usual manner. The loading is 1,000 W for ordinary a.c. voltages. An instruction leaflet accompanies each iron.





Steam-electric iron for dry and wet pressing

Plastic Lamp Shades

A new range of lamp shades of the "Coolicon" shape has been announced by BENJAMIN ELECTRIC, LTD., Brantwood Works, Tariff Road, Tottenham, London, N.17. They are made in two sizes of 9 and 11 in. for 60 and 100 W lamps; all are plastic mouldings with white shades and coloured galleries. Another model has a white shade with a white enamelled metal gallery and the one-piece metal "Coolicon" vitreous enamelled white inside and green outside. There are no screws or other fastening devices; the galleries and shades simply clip together. The metal gallery type has the additional feature that its shade can be removed without disturbing the lampholder. The all-metal type, which has been on the market for many years, has been made to nest better for packing and storing by slight adjustment of the neck. All have a 20-deg cut-off and fit on any standard b.c. shade carrier lampholder.

Bed Heater

A heater moulded from a brown plastic substance and purposely intended to resemble the conventional rubber hot-water bottle in appearance is offered by R. A. ROTHERMEL, LTD., Canterbury Road, London, N.W.6, under the trade name of "RAR." It has a 40-W element with thermostat and a push-bar switch accommodated in the "neck"; 100 to 200 V and 200 to 250 V models are available.

Miniature Radio Set

A broadcast radio receiver of small dimensions is announced by VIDOR, LTD., West Street, Erith, Kent. Its case, which is 8¾ in. wide, 3⅝ in. high and 3⅝ in. deep, is moulded of a black plastic substance with an ivory coloured control panel. A leather carrying strap is attached and the action of opening the lid switches on the set. A four-valve superheterodyne circuit is employed for battery operation. The set is expected to be on the market in June.

Soil-heating Cable

A soil-heating outfit, manufactured by S. B. JACKSON, LTD., Windsor House, Victoria Street, London, S.W.1, consists of a waterproof 250-W step-down transformer, which is made to comply with the appropriate B.S. Specification; to its low voltage output terminals is connected some 20 yards of soil-heating cable suitable for use under cloches, in frames and greenhouses, or in the open, for horticultural service. Special attention has been paid to the minimization of voltage drop at connections and three-heat switching is provided.

Radio Testing Apparatus

Radio testing equipment now available from PYE, LTD., Radio Works, Cambridge, includes a workshop signal generator incorporating a step-attenuator of the makers' patent design for progressively reducing the signal generated from 0·1 V to 1 μV. There is an output power meter with a matching transformer of special design to preserve accuracy over a wide range of frequency. A handy component tester enables resistance, capacity and the state of insulation to be determined. All three devices can also be assembled together in the form of a workshop test rack for use in dealers' premises.

ELECTRICITY SUPPLY

Glasgow Plant Contracts. Northern Ireland Scheme Approved.

Bangor.—EXTENSIONS.—The City Council is applying for sanction to borrow £3,828 for supplying electricity to Penrhosgarnedd, Llandegai and Garth.

Bedford.—SUPPLY TO FARMS.—The Electricity Committee is to extend overhead lines at a cost of £648 to supply farms at Stagsden and Potton.

ROAD LIGHTING.—A revised scheme for lighting the trunk road will cost £3,900.

Beds, Cambs and Hunts.—DISTRIBUTION PLANS.—A sum of £750,000 is to be expended by the Bedfordshire, Cambridgeshire and Huntingdonshire Electricity Co. on the extension of its distribution system. The company plans to serve another 137 villages in the three counties covered by the undertaking, and is also making allowance for new towns and villages.

Bristol. — IMPROVEMENT SCHEMES. — Three schemes proposed by the Electricity Committee involve a total estimated expenditure of £1,207,127. At the request of the Electricity Commissioners multi-cyclone grit collectors are to be installed on the two largest boilers at the Portishead generating station, the estimated cost being £56,950. To relieve the severe overload being experienced at the Feeder Road works it is proposed to transfer some of the load to the St. Paul's distribution centre, and for this purpose additional switchgear and cable work entails an expenditure of £60,000. In order to meet the anticipated additional load to be carried from the Portishead station to the Bristol area it is essential to lay four 33-kV cables together with pilot cables, to be ready for commercial operation by the autumn of 1947. The cables will link with the Feeder Road works and to meet the increased load in the Fishponds-Kingswood district there will be six cables to Kingswood.

Chester.—SUPPLY TO BLACON.—The Electricity Committee is to extend the supply to Blacon at an estimated cost of £43,000.

Fleetwood.—CONTRIBUTION TO RATES.—Criticizing the taking of £800 for rate alleviation from the electricity undertaking, Alderman C. Saer stated at a meeting of the Finance Committee that the undertaking was not expected to make any profit this year. The electrical engineer had not been consulted before the decision was made. The borough treasurer said that in the event of any loss the undertaking could use the balance on the previous year.

Glasgow.—NEW GENERATING STATION.—Sir Alex. Gibb & Partners have been authorized to proceed with arrangements for putting down test piles on the site of the new generating station, the estimated cost being £1,500. Having regard to the urgency of the matter, the Corporation sub-committee concerned with the new station has agreed that Babcock & Wilcox, Ltd., shall be given instructions to proceed with the contract for boiler plant so soon as the technical aspects have been adjusted and approved and without awaiting the formal consent of the Electricity Commissioners. A tender by C. A. Parsons & Co., Ltd., for the supply and erection of the two 50,000-kW turbo-alternators with condensers and auxiliary apparatus, has been forwarded to Merz & McLellan, the consulting engineers for their report and also for discussion by them with the Central Electricity Board with a view to obtaining the approval of the Board.

Gravesend.—LOAN APPLICATIONS.—Application is being made to the Electricity Commissioners for permission to borrow £750 for increasing the supply to an industrial consumer, £3,800 for unspecified mains and services for the period to September 30th, 1946, and £1,800 for the establishment of a Class A meter testing station.

Islington.—RATE CONTRIBUTION.—The Electricity Committee reports a surplus on the electricity undertaking for the year of £31,279 and it is recommended that £10,000 shall be allocated to rate relief.

Leigh (Lancs.).—STREET LIGHTING.—The Town Council is to install mercury vapour lighting in two of the town's main roads to supersede gas lighting.

HOUSING SUPPLY.—An electricity supply is to be provided at Thompson Street housing site at a cost of £4,703.

Liverpool.—UNDERTAKING'S JUBILEE.—Next June the Electricity Department will have completed fifty years' operation and consideration is now being given to the celebration of the event.

CLARENCE DOCK OUTPUT.—The output of the Clarence Dock power station last year was 1,183 million kWh, of which 486 million kWh was exported to the grid.

Margate.—SUPPLY TO RURAL AREAS.—The Town Council is to approach the Isle of Thanet Electricity Supply Co., Ltd., in regard to the supply of electricity to Lydden, Flete and other rural parts of the district.

Middlesbrough.—RATE RELIEF.—A sum of £10,000 is being taken from the electricity funds by the Town Council for the relief of rates.

Northern Ireland.—DEVELOPMENT SCHEME APPROVED. — The Ministry of Commerce has granted the application of the Electricity Board for Northern Ireland for confirmation of the No. 8 Development Scheme, covering parts of the counties of Antrim and Londonderry. The application was the subject of an inquiry lasting seven days last July, the objectors including the Antrim Electricity Supply Co. and the Antrim Electricity Distribution Co., subsidiaries of the British Electric Traction Co.

Pontefract.—TIME EXTENSION.—The Electricity Commissioners have made an Order extending by three years the time allowed for the re-acquisition by the Corporation of the undertaking authorized by the Pontefract Corporation Orders, 1907 and 1912.

Swindon.—PROPOSED CAPITAL EXPENDITURE.—The Electricity Committee estimates the following capital expenditure for the ensuing year:—Mains and services, £18,420, buildings,

£1,050; plant, £4,180; meters and apparatus, £10,000; and Moredon power station, £35,000.

St. Pancras.—DEFICIT.—The Electricity Committee reports that there is likely to be a deficit of £10,077 for 1945-46 and the estimates for 1946-47 indicate a deficiency of £7,032.

Troon (Ayrshire).—ELECTRIC LIGHTING FOR GASWORKS.—The Town Council is to install electric lighting in the gasworks.

Overseas

Jersey.—GERMAN POWER STATION BEING DISMANTLED.—The steam driven power station in St. Peter's Valley, Jersey, erected by the Germans during the occupation as an auxiliary plant in case of the failure of the main power station, is being dismantled and the machinery exported, some to England and some to France. It is estimated that the plant is worth at least a quarter of a million pounds.

I.E.E. Scholarships for 1946

THE Council of the Institution of Electrical Engineers will this year consider the award of four research scholarships and grants, and six scholarships for undergraduates and students to attend universities and technical colleges. These awards will be made subject to the regulations laid down by the Ministry of Labour and National Service regarding the candidates' ages at the commencement of their courses.

The research scholarships are: Ferranti, value £250 per annum for two years; Oliver Lodge, value £250 for one year (but may be extended for a second year); Swan Memorial, value £120 for one year; and the C.P. Sparks War Thanksgiving Fund, value not exceeding £100 per annum.

Student scholarships are: Duddell, value £150 per annum for three years; William Beedie Esson, value £120 per annum for two years, renewable in approved cases for a third year; Silvanus Thompson, value £100 per annum, plus tuition fees for two years; Salomons, value £100 for one year; and Thorrowgood, value £25 per annum for two years.

The closing date for receiving applications is April 15th, for student scholarships and June 1st for research scholarships. The award of student scholarships will be made towards the end of June. Full particulars of the scholarships, and nomination forms, may obtained from the Secretary, Institution of Electrical Engineers, Savoy Place, London, W.C.2.

Propeller Testing

HOW full size marine propellers are tested in order to determine the modes and frequencies of the natural vibrations of their blades is described by Professor L. C. Burrill (King's College, Newcastle-upon-Tyne) in a paper submitted to the North-East Coast Institution of Engineers and Shipbuilders.

The exciting vibrator is a loud-speaker of ordinary pattern with an extended shaft lightly supported on two horizontal spiders for conveying very minute oscillating forces to the propeller blades, at a frequency determined by the dial setting of a beat-frequency oscillator of 4-W output. The latter is quite sufficient to vibrate even a large propeller, but to avoid overloading possibly causing distortion an amplifier is interposed in the circuit to furnish from 10 to 15 W for the largest ship's propellers tested.

The model patterns are mapped with the aid of a piezo-electric pick-up, based on the direct bending of a crystal mounted to form a cantilever with a style in contact with the vibrating surface, with a cathode-ray oscillograph for recording. Apparatus was initially supplied by the Mullard Wireless Service Co., Ltd., but the speaker-exciter and pick-up finally utilized were designed and made by the De Havilland Aircraft Co., Ltd.

The tests are being carried out for the Manganese Bronze & Brass Co., Ltd. The present paper is a general account, since the results are to be analysed completely at King's College where it is proposed to extend the experimental method described to the testing of propellers in vibration under water. It is also proposed to apply the same method to a propeller in position on the shaft of an actual ship and to examine "singing" propellers fitted to a twin-screw vessel stroboscopically with the aid of under-water photography.

Fatalities

Accident at Factory.—While working at the Enfield factory of the Edison Swan Electric Co., Ltd., Leslie Wilfred Garner (32), an exhaust pump attendant, received a fatal electric shock. At the inquest, when a verdict of "Accidental death" was recorded, Mr. P. E. Kane, works manager, said that in his opinion Mr. Garner, thinking he had found a fault at his bench, decided to run a wire to the next bench and had probably been testing the connections when he received the fatal shock. Strictly speaking he should have called the electrician, but he was an extremely efficient and enthusiastic worker and was perhaps anxious to finish the job he was doing without delay. It was afterwards found that there was no actual fault at the bench; it was wired for a special kind of valve.

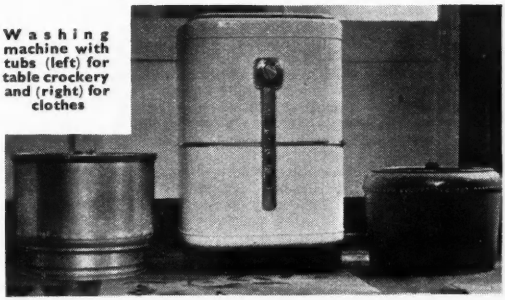
Shock While Moving Car.—Eric Charles Lemar (26), employed with the British Hard Rubber Co., Ltd., Enfield, received a fatal shock when he was moving a car clear of the factory gates to let a lorry through. The coroner said it appeared that a tension was placed on an outside cable connected to an electric heater inside the bonnet of the car. The edge of the bonnet must have cut the cable.

Wrongly Connected Drill.—That he had "picked up" his knowledge of electricity in the course of his work and now realised he had made a mistake in connecting up an electric drill, was the admission made by a mechanic at the inquest at Leicester on the user of the drill, who died following an electric shock. An electrical engineer who examined the drill after the accident confirmed that a wrong connection had been made.

Dual-purpose Washer

Crockery and Clothes Cleansing

A HOUSEHOLD washing machine (the "Thor Automagic") with interchangeable tubs, one for clothes and the other for table crockery, glassware and cutlery, is expected to become available to the retail trade in June. The idea is due to Mr. A. H. Young of Edmundson's Electricity Corporation, Ltd., and Mr. J. W. Barton, of the Hurley Machine Co. (England), Ltd., 55, Oxford Street, London, W.1. The latter took the proposal to the United States where designs were developed in the company's Chicago factory for production in America as well as in a former aircraft factory in the West of England.



Washing machine with tubs (left) for table crockery and (right) for clothes

The white cabinet, enamelled inside and out, is 2 ft. square, 3 ft. high and weighs 212 lb. The mechanism is housed in the base; resilient mounting in conjunction with a gyro-disc stabilizer minimizing vibration. A 250-W motor of standard type drives the vertical shaft through an enclosed gear box as well as the water pump. A reversing rotary switch on the front of the cabinet operates in conjunction with three solenoid-actuated gear changers.

The tub, with a six-vane reciprocating agitator, holds 8 lb. of dry clothes (one double-bed sheet weighs about 2 lb.) and additional garments can be dropped in while the machine is operating. Nine gallons of hot water is needed for washing, then cold double rinsing and spin-drying at 600 r.p.m. in 30 minutes is put into operation simply by manipulating one switch without lifting the lid of the cabinet.

The shape of the tub causes the water to spiral centrifugally upward and drain away through a single row of holes at the top, but well below the inwardly-curving rim of the tub which prevents overflow. The tub can be drained and refilled with fresh water for rinsing the clothes in four minutes. There are no drain valves and water may be poured in at the top by hand or admitted through a swinging faucet underneath the lid of the cabinet.

The lift-off tubs are of light weight and differ in form; that for table ware contains a wire basket for glasses and will cleanse all the crockery and cutlery needed by six people for one meal in 12 minutes. The crockery remains stationary; water is directed upward through powerful jets in the revolving base of the stationary tub, its lid (with a central glass window) being fluted to break up the water jets. Three pints of hot washing water and three pints of cold for rinsing will suffice, while drying air may be blown over the cleansed crockery. All the interior washing surfaces are non-rusting and easy to reach and clean.

I.E.E. Luncheon

President on Exchange of Views

OVER two hundred members attended the informal luncheon of the Installations Section of the Institution of Electrical Engineers at the Waldorf Hotel last week. MR. FORBES JACKSON (chairman of the Section) presided, making a witty speech of welcome. DR. P. DUNSHEATH (President, I.E.E.) remarked upon some of the impressions he had formed during his recent visit to the United States and Canada.

Dr. Dunsheath said he was impressed by the way in which engineers across the Atlantic found time to exchange experiences by correspondence and to receive visitors who were met on the boats, not left to find their own way about strange places. Secondly, in Canada, engineering had a much better "press" than at home, where it had no publicity at all, for the technical Press did not touch the "man in the street." Something should be done to rectify that omission, and soon. Thirdly, and perhaps most important, that was the way in which technical institutions across the Atlantic were looking after their young men. There was a very close bond between those who had "arrived" and students, whereas the tendency at home was to set out programmes instead of letting students put forward their own points of view. The gap which existed at home between the old and the young must be bridged. In Canada they even had something in the nature of a "ceremony of entry" to the profession.

He was much impressed with the loyalty of the Dominions. The home country must "cash in" on that goodwill, which provided great possibilities for co-operation. There was to be a Commonwealth Conference in the autumn to discuss matters of common interest, education, training and maintenance of the status of engineers.

Mr. A. H. Mumford (chairman, Radio Section) spoke on behalf of the Technical Sections of the Institution all of whose chairmen were present.

FINANCIAL SECTION

Company News. Stock Exchange Activities.

Reports and Dividends

Northmet Power Co.—After referring to the statement by the Incorporated Association of Electric Power Companies affirming the supply companies' determination to resist nationalization by all legitimate means, Lord Ashfield (chairman and managing director) reviewed the activities of the company. He said that their sales during last year reached a new record at 1,058 million units, an increase of 3¾ million on 1944. For the whole country the units sold had increased by 56 per cent between 1938-39 and 1944-45, while the Northmet figure was 56 per cent. The number of consumers supplied directly and indirectly at December 31st last was 437,000, those supplied directly numbering 341,000.

On the subject of operating expenses, he said that coal prices for the last quarter of 1945 were almost double those of 1938; in addition the deterioration in quality was very marked, the ash content being about double the pre-war amount. There were also higher charges in respect of extra plant put in commission and additional rates. The time was fast approaching when serious consideration would have to be given to the tariff structure, especially the fixed charge for "all in" rate consumers. There being no minimum charge, some consumers on this tariff were being supplied at an uneconomic rate. On this point he mentioned that the Electricity Commissioners had recently appointed a committee to make recommendations as to the methods of charging best adapted to promote uniformity and development. He also referred to the adoption by the Commissioners of 240 V—the supply voltage in the Northmet area—as the standard.

At an extraordinary general meeting held subsequently approval was given to the Bill seeking powers for the erection by the North Metropolitan Power Station Co. of a new generating station at Hoddesdon.

County of London Electric Supply Co., Ltd.—Engineering developments planned by the company were outlined and the Government's nationalization proposals criticized by the chairman (Sir Robert Renwick) in his speech at the annual meeting.

Dealing first with the accounts, he said that during the war the dividend on the company's ordinary capital had been cut from 10½ to 8 per cent. The present year was bound to be difficult, and they were proposing to pay 10 per cent (including the interim) against earnings of rather more than 11 per cent. Turning to the commercial aspects of the undertaking, he said that the increase from 1,528 million to nearly 1,568 million units supplied to their own consumers was accounted for by increased sales of 30 million units in bulk and traction supplies and 28 million units in private supplies, power sales showing a not unexpected reduction. No change had been made in the standard rates of tariff during the year, and in spite of the mass evacuation and devastation in the area, the average price for lighting, heating and cooking was less than 8 per cent higher than the pre-war price, compared with the well over 100 per cent rise in fuel costs. The company alone supplied over 369,000 consumers and for the group the number was nearly 750,000. During this year they proposed to introduce a short-term hire-purchase scheme for cookers and to provide water heaters on simple hire.

Engineering projects included the extension of the Barking station by an additional 225,000 kW at an estimated cost of £7,867,000; rebuilding the Blackwall Point station of the South Metropolitan Company, giving it a capacity of 90,000 kW, at a cost of £3,240,000; resumed construction of the second section (started in 1939) of the Littlebrook station of the Kent Electric Power Co., the capacity of this section being 120,000 kW and the estimated cost £3,658,000; and construction of the first 100,000-kW section of a station (ultimate capacity 200,000 kW) in the area of the Bournemouth & Poole Electricity Supply Co., the estimated initial outlay being £4,928,000. Thus on generation alone they had to face an expenditure of over £19,693,000 in five years. In addition, transmission work in hand for completion this year involved the group in an expenditure of about a million pounds.

The chairman claimed that on the day their industry became nationalized that would be the last day on which consumers of electricity in this country could expect cheaper electricity. It was becoming obvious from the progress of the Coal Industry Nationalization Bill that the interest of the consumer was being disregarded, reasonable amendments to afford protection as to price and quality having been completely turned down. The necessity for co-ordinating all forms of fuel and power was given as one reason for nationalizing the prosperous and virile electricity industry. Unless this meant that consumers would be given no free choice it could only mean that losses incurred on coal, and possibly gas, would have to be made up from the surpluses earned on electricity. Claiming that the electricity supply industry was the best of all the public services, he said that what was wanted was organized expansion and development within the industry itself, and this could best be achieved through a system of area committees making recommendations to the Commissioners.

South London Electric Supply Corpn., Ltd.—Although the area suffered considerably during the war the number of consumers at the end of last year—48,290—was more than 4,000 in excess of the number at the end of 1938. This was stated by the chairman (Sir Robert Renwick) at the annual meeting. Sales amounted to 66·7 million units in 1945, an increase of 4 million units over 1944 but still some 2 million short of the 1938 total. Compared with the pre-war year supplies for lighting, heating and cooking had increased from 42·8 million to 45·9 million units, while power sales had dropped from 23·8 million to 20·2 million units, and supplies for street lighting were also down.

In recent Ministerial statements he detected

certain qualifications to the blunt announcement on the Government's nationalization intentions made by the Lord President of the Council last November. A few days ago the Minister of Fuel and Power stated that it was the view of the Government that the electricity supply industry required reorganization and that it was his intention to consult all branches of the industry before the Government finalized its proposals. Mr. Shinwell had made no new discovery that the industry needed some reorganization; it had itself put forward numerous proposals for curing its ailments, but it did not suggest nor like the prospect of a complete upheaval through State ownership. The weak spots of the industry arose directly from antiquated legislation.

The West Kent Electric Co., Ltd.—To the 1945 revenue balance of £142,951 (compared with £155,313 for 1944) is added £83,653 (nil) from contingencies and other reserves. Allocations are: depreciation reserve £57,500 (£47,500), tax £48,000 (£55,000), contingencies nil (£10,000) and general reserve £75,000 (£10,000). The ordinary dividend for the year is increased from 8 to 10 per cent and £48,926 (£39,072) is carried forward.

London Associated Electricity Undertakings, Ltd.—The profit on net revenue account for 1945 of £401,121 compares with £214,565 for the preceding year, but while income tax paid from the former takes £22,995, in 1944 there was an income tax refund of £23,646. The ordinary dividend is raised from 4 to 6 per cent, £24,000 is transferred to the stockholders' reserve fund (a similar amount was taken from the fund in 1944) and £232 (£1,058) is carried forward.

The South Wales Electric Power Co. records a net profit for 1945 of £127,068 (against £192,325 for 1944), after providing £20,000 (£100,000) for taxation, £50,000 (£25,000) for contingencies and deferred repairs reserve, and £240,000 (same) for depreciation and renewals. It is proposed to pay a final dividend of 4 per cent, maintaining the year's distribution at 6 per cent. A sum of £201,621 (£194,553) is carried forward.

Lancashire Electric Light & Power Co., Ltd.—The report for 1945 shows a balance on profit and loss account of £368,978 (against £369,588), before charging £184,800 (£184,872) income tax. The dividend on the ordinary shares is maintained at 7½ per cent by a final payment of 5 per cent, an additional ½ per cent (same) is proposed to be paid on the participating stock and £15,151 (£15,613) is carried forward.

The Scottish Power Co., Ltd., together with a final dividend of 5 per cent on the ordinary stock (again making 8 per cent for the year) proposes to pay a bonus of 1 per cent (nil last year). The net revenue for 1945, after taxation, was £304,181, compared with £273,358 for 1944.

Clyde Valley Electrical Power Co.—A decrease in receipts from £3,130,001 to £2,967,927 is shown in the company's accounts for 1945, and the operating profits for the year amounted to £498,715 (against £709,806 for 1944). After crediting £220,000 (against nil) estimated E.P.T. recoverable, together with interest, dividends, etc., of £18,132 (£21,713) there is £736,847 (£731,519) available. A sum of £100,000 is again provided for future taxation and £275,000 is transferred to the contingency fund, while £10,000 (£30,000) is set aside for deferred repairs. As already reported, the dividend on the ordinary stock for the year is maintained at 8 per cent by a final payment of 5 per cent, and £208,315 (£186,468) is carried forward.

The Mersey Power Co., Ltd.—Receipts for 1945 amounted to £1,194,880 (against £1,244,627 for 1944), the net revenue being £394,316 (£387,549), to which is added £15,995 (£104,128) from adjustments relating to previous years. A sum of £110,000 (£115,000) is provided for taxation, £199,772 (£299,207) for depreciation, £20,000 (nil) for war damage contribution and £2,875 (same) for employees' bonus account. The ordinary dividend is again 8 per cent and £106,800 (£85,596) is carried forward.

The Mid-Cheshire Electricity Supply Co., Ltd., records a net revenue for 1945 (including dividend receivable from the Mersey Power Co.) of £78,624, compared with £102,918 for the preceding year. From this are deducted income tax £30,978 (£42,364), depreciation and renewals £15,272 (£17,831) and staff fund and supplementary pensions account £2,500 (£7,500). It is proposed to pay an ordinary dividend of 8 per cent (same), carrying forward £25,594 (£25,253).

The Sevenoaks & District Electricity Co., Ltd., reports a balance on revenue account for 1945 of £50,038 (against £53,610). The ordinary dividend is maintained at 7 per cent and £11,432 (£6,442) is carried forward.

Cambridge & District Electric Supply Co., Ltd.—From a net profit of £38,214 for 1945 (against £34,967 for 1944) the company is paying a final dividend of 4½ per cent, again making 7 per cent for the year.

Waste Heat & Gas Electrical Generating Stations, Ltd.—The profit for the year ended January 31st last was £8,758 (against £8,786), of which £2,922 (nil) is applied to general reserve. The ordinary dividend is maintained at 8 per cent.

The Midland Electric Manufacturing Co., Ltd., records a trading profit for 1945 of £116,752, compared with £116,719 for the preceding year, plus interest and transfer fees of £2,720 (£2,161). Taxation absorbs £57,174 (£70,257) and to the net revenue of £61,948 (£48,423) is added £3,232 (nil) interest on tax certificates. The ordinary dividend is increased from 10 to 15 per cent and a bonus of 15 per cent is again being paid. General reserve receives £20,000 (same) and development reserve £20,000 (nil). The carry-forward is £35,687, against £28,960 brought in.

Scophony, Ltd.—Sir Maurice Bonham Carter (chairman) stated at the annual meeting that while the position in regard to television would remain obscure until the Government formulated its plans, the company was concentrating on current developments and improvements in the Scophony system and would be ready to proceed with manufacture when the time was ripe. In the meantime there were other products to engage their attention. and he mentioned the stroboscope; a high-speed camera capable of taking 10,000 pictures a second; and an automatic type-setting instrument. There were also the possibilities offered by the "Skiatron" for use in fields other than radar and television,

and industrial applications of the high-speed, high-cycle induction motors manufactured during the war mainly for aircraft.

Referring to the proceedings instituted by the Federal authorities of the United States complaining that the agreements for licence of the company's American patents offended the anti-trust laws, he said the agreements were drafted in the United States by the legal advisers of the participants and there was no desire to impose limiting conditions other than those usually embodied in patent agreements.

At the meeting approval was given to the issue at par of 199,900 ordinary shares of 5s.

Hoover, Ltd.—Speaking of the company's intention to widen its range of products, Mr. C. B. Colston (chairman and managing director) said at the annual meeting that their new Scottish factory at Cambuslang was mainly concerned with the production of fractional-horse-power motors. The entire output for this year, which would be substantial, had already been sold. More than one-third of it was for direct export and a fair proportion of the remainder would be incorporated in equipment for overseas. They were already negotiating for the purchase or lease of other factories. On the subject of dispersal, he said that their experience during the war was that a factory of about 1,000 people was highly efficient. They were following the policy of taking the work to the worker.

The Telegraph Construction & Maintenance Co., Ltd., announces a net profit of £53,985 (against £50,710 for 1944) and recommends a final dividend of 5 per cent, again making 10 per cent for the year.

Sydney S. Bird & Sons, Ltd., report a net profit of £13,122 for the fifteen months to the end of 1945, compared with £10,736 for the preceding twelve months. It is proposed to pay a final dividend of 17½ per cent, increasing the year's distribution from 30 to 37½ per cent.

Charles Clifford & Son, Ltd., report a net profit of £20,967 for 1945, compared with £18,428 for the previous year. It is proposed to pay a final dividend of 2s. 6d. tax free per ordinary share, again making 3s. 6d. tax free for the year.

The Greengate & Irwell Rubber Co., Ltd., reports a net profit of £49,070 (against £46,144). The ordinary dividend for the year is 15⅝ per cent and the deferred dividend 25 per cent (unchanged); £63,388 (£55,069) is carried forward.

The Derbyshire & Nottinghamshire Electric Power Co., has applied to the Electricity Commissioners for a Special Order authorizing the company to raise additional capital.

The Metropolitan Electric Supply Co., Ltd., is increasing its final dividend from 5 to 6 per cent, making 9 per cent (against 8 per cent) for the year.

The Nigerian Electricity Supply Co., Ltd., is again paying an interim dividend of 3 per cent.

The Renold & Coventry Chain Co., Ltd., has declared an interim ordinary dividend of 3 per cent (same).

The Decca Record Co., Ltd., has announced an interim dividend of 33⅓ per cent (same).

The British Engine, Boiler & Electrical Insurance Co., Ltd., reports a profit for 1945 of £74,699, after providing for unexpired risks. The staff pension fund receives £35,000 and the final dividend is 17s. 0d. per £5 share, making 34s. 0d. for the year; £237,564 is carried forward.

New Companies

Electronic Tubes, Ltd.—Private company. Registered March 16th. Capital, £300,000. Objects: To acquire part of the assets, liabilities and undertaking of A. C. Cossor, Ltd., and to carry on the business of manufacturers of, and dealers in, radio receiving and transmitting valves, cathode ray tubes, thermionic tubes, etc. Subscribers: F. Hopton and F. M. Baxter, 118, Old Broad Street, E.C.2. Registered office: Kingsmead Works, Fassetts Road, High Wycombe, Bucks.

Electronic Developments (Surrey), Ltd.—Private company. Registered March 11th. Capital, £5,000. Objects: To carry on the business of manufacturers of, and dealers in, electrical, wireless and television transmitting and receiving apparatus, etc. Directors: S. Bint, 21, Winslow Way, Walton-on-Thames, and J. E. Ballard, 150, Warren Drive, Tolworth. Secretary: A. F. Norman. Registered office: 78, Victoria Road, Surbiton.

Condilectric Fittings, Ltd.—Private company. Registered March 13th. Capital, £2,000. Objects: To carry on the business of manufacturers of tubes, fittings, switchgear, accessories, etc. Subscribers: P. H. Bentham, 10, The Avenue, Bhylls Lane, Compton, Wolverhampton, and D. H. Jones, 146, Trysull Road, Wolverhampton. Registered offices: 10, The Avenue, Bhylls Lane, Compton, Wolverhampton.

Ward Pearce, Ltd.—Private company. Registered March 6th. Capital, £2,000. Objects: To carry on the business of assemblers, manufacturers, suppliers and equippers of electric lighting, heating, power, telephone and bell installations, etc. Directors: H. W. Pearce, 53, Barn Hill, Wembley Park, Middlesex, and E. H. Blinkhorn, 75, Oakington Avenue, Wembley Park, Middlesex. Registered office: 9, Basinghall Street, E.C.2.

G.T.G. Electrics, Ltd.—Private company. Registered March 5th. Capital, £2,000. Objects: To carry on the business of general electricians and electrical contractors and manufacturers, etc. Directors: A. Gould, 81, Beach Road, Jaywick, nr. Clacton-on-Sea, and two others. Registered office: 5-6, Kingsbury Green Parade, N.W.9.

Mortgages and Charges

Fleet Electrics, Ltd.—Issue of March 1st, 1946, of £1,000 debentures, part of a series already registered.

Roncar, Ltd.—Deposit on February 28th, 1946, of deeds of 175, Hackney Road, E.2, to secure all moneys due or to become due from the company to Barclays Bank, Ltd.

Castle Fuse & Engineering Co., Ltd.—Mortgage and charge on property in Hill Street, Toxteth Park, Liverpool, dated February 19th, 1946, to secure all moneys due or to become due from the company to Midland Bank, Ltd.

Liquidations

Princely Battery Co., Ltd.—Liquidator, Mr. H. P. Naunton, Columbia House, Aldwych, London, W.C.2, released March 7th, 1946.

STOCKS AND SHARES

AS the date of the Budget draws nearer, so business in Stock Exchange investment securities tends to contract. No little uncertainty is felt as to the Chancellor of the Exchequer's intentions with regard to E.P.T. Some people think it will be either abolished or greatly modified, but the general consensus of opinion is that if this is done a fresh form of taxation will be substituted. What may happen is everybody's guess. This exercises a restrictive influence, in addition to which there are the daily Parliamentary debates and disputes over nationalization. Prices hold their ground remarkably well, all things considered, and new issues are being taken up with avidity by the investing public.

Nationalization

Whereas the coal industry was at first inclined quietly to acquiesce in the nationalization policy, other threatened industries are by no means taking it lying down. Each of the chairmen of the four big railway companies, at the recent annual meetings, urged cogent arguments in favour of private control, although, incidentally, it may be added that the Government has announced its intention of proceeding with nationalization of the Home railways before the end of the present year.

Electricity Supply

Factors at present influencing the market in electricity supply shares include Mr. Shinwell's apparent change of tone about nationalization, and February's increase in the country's output of electricity. The market is not disposed to build any particularly firm hopes on the Minister of Fuel and Power's recent statement. However, his reference to the Government's intention to consult all branches of the electricity industry before introducing nationalization is welcomed as evidence that he is at least sensible of active opposition to it. The expansion of electricity output in February reverses the trend which had prevailed since last May.

A Month's Fluctuations

Cable & Wireless ordinary stock has been a poor market during the month now ending, and at 95½ the ordinary is 4½ points down, the preference showing a fall of 2 at 111. Tokyo Electric sixes are 11 points down since the end of February. Amongst Home railway stocks, Southern preference gained 2½ at 110½, in sympathy with the rises amongst gilt-edged securities. In the manufacturing and equipment group, Midland Electric Manufacturing put on 5s., rising to 8. International Combustion are lower at 8 $\frac{9}{16}$ ex dividend. Oriental Telephones have lost 7s., receding to 57s. 6d.

Ericsson have given way to 53s. 9d. On the other hand, Enfield Cables at 64s. 3d. are 1s. 9d. to the good. Brush ordinary are a better market at 11s. 6d. Associated British Engineering are lower at 47s. 6d. De la Rue at 10½ are 7s. 6d. higher. In the radio group Cossor, partly in consequence of the strike at the works, fell 1s. 9d. to 40s. 9d. Decca Records, now included in our price lists, are 3s. 9d. lower at 61s. 3d. than they were a month ago, and E.M.I. at 31s. 6d. have fallen 1s.

Dividends

The North Eastern Electric Supply Co's figures show that lower taxation provision has offset, with a substantial margin, a decline in profits. The Bournemouth and Poole report shows lower net profits, which, however, cover the maintenance of the dividend at 12½ per cent. City of London Electric, in raising the annual distribution from 6 to 7 per cent, has brought the rate within ½ per cent of the regular pre-war payments. A similar increase in the Metropolitan Electric dividend to 9 per cent leaves a gap of 1 per cent between the present and the pre-war rates. Anticipation had looked for a return to the old 10 per cent, and the price went back a trifle, to 42s. 6d. The Scottish Power distribution for the year of 9 per cent includes 1 per cent as bonus. Last year there was 8 per cent dividend and no bonus.

Switchgear & Cowans

Mention was made here last month of the rarity of any movement in the price of Switchgear & Cowans 5s. shares, a rise of 1s. or so being noticed at the time as somewhat unusual. The improvement has been carried further, the price advancing to 23s. 9d upon the issue of a report, to be submitted to the annual meeting on April 9th, which shows the company to have done very well in the year ended last December. The amount available for distribution is £40,700, an increase of £6,000, and, in addition to the regular dividend of 20 per cent per annum, a bonus for the year is declared at the rate of 3d. per share. It would be a mistake to allow for this bonus in calculating the yield which the shares afford, but the company is obviously making progress and the present price does not appear to be excessive.

Associated Electrical Industries

Associated Electrical Industries have been dull since publication of the dividend and preliminary profits statement, and news of the proposed new issue. The reaction in the price to 59s., after its rise to 61s. 6d., is said to be due to disappointment that the substantial rise in profits has not led to any change in the dividend rate, maintained at 10 per cent for the eleventh consecutive year. However, through the proposal to issue new shares at 50s., in the proportion of one for every five held, shareholders acquire rights worth about 2s. per share.

Telegraph Construction and Taylor Tunnicliff have both repeated their distribution for the

(*Continued on page* 513)

ELECTRICAL INVESTMENTS

Past Month's Price Changes

Company	Dividend Previous	Dividend Last	Middle Price Mar. 22	Month's Rise or Fall	Yield £ s. d.
Home Electricity Ordinary					
Bournemouth and Poole	12½	12½	61/–	..	4 2 0
British Power and Light	7	8	32/–	−1/–	5 0 0
City of London	6	7	29/–	+6d.	4 16 7
Clyde Valley	8	8	39/–	−3/6	4 2 1
County of London	8	10	42/–	−1/–	4 15 3
Edmundsons	6	6	27/6	..	4 7 3
Elec.Dis.Yorkshire	9	9	41/3	−¼	4 7 4
Elec. Fin. and Securities	12½	13½	57/3	+1/6	4 17 1
Elec. Supply Corporation	10	10	46/–	+1/–	4 7 0
Lancs. Light and Power	7½	7½	31/6	−2/–	4 9 7
Llanelly Elec.	6	6	25/6	−6d.	4 14 1
Lond.Assoc.Electric	3	4	26/6	−1/–	4 10 7
London Electric	6	6	27/6	+6d.	4 7 3
Metropolitan E.S.	8	9	42/6	−6d.	4 4 9
Midland Counties	8	8	42/6	+3/–	3 15 6
Mid. Elec. Power	9	9	43/–	+6d.	4 3 8
Newcastle Elec.	7	7	30/–	..	4 13 4
North Eastern Elec.	7	7	31/–	−2/–	4 11 10
Northampton	10	10	47/6	−6d.	4 4 6
Northmet Power	7	9	40/6	+1/–	4 9 0
Richmond Elec.	6	6	27/–	..	4 9 0
Scottish Power	8	9	37/6	..	4 16 0
Southern Areas	5	5	22/3	..	4 10 6
South London	7	7	30/–	..	4 13 4
West Devon	5	5	25/6	..	3 18 5
West Glos.	4½	3½	27/6	−6d.	2 11 0
Yorkshire Elec.	8	9	41/6	−1/6	4 6 10
Public Boards					
entral Electricity:					
1955–75	5	5	114½	−½	4 7 4
1951–73	4½	4½	106	+1	4 5 0
1963–93	3½	3½	106	+1	3 6 0
1974–94	3½	3½	104	+1	3 2 6
LondonElec.Trans.	2½	2½	99½	..	2 10 4
London & Home Counties 1955–75	4½	4½	112	+½	4 0 5
Lond.Pass.Trans.Bd.					
A	4½	4½	123½	..	3 13 0
B	5	5	117½	..	4 5 1
C	3	3	57	−4	5 5 3
West Midlands J.E.A. 1948–68	5	5	105½	−1	4 14 9
Overseas Electricity Companies					
Atlas Elec.	Nil	Nil	8/9	−1/–	—
Calcutta Elec.	6*	6*	59/–	+1/–	2 0 8
Cawnpore Elec.	7	13	65/6	−2/–	3 19 3
East African Power	7	7	40/–	−6d.	3 10 0
Jerusalem Elec.	7	5	25/6	−6d.	3 18 6
Kalgoorlie (10/–)	5	5	12/–	−6d.	4 3 4
Madras Elec.	4	6	37/–	−1/6	3 4 10
Montreal Power	1½	1½	27	+½	—
Nigerian Elec.	10	10	41/–	..	4 17 7
PalestineElec."A"	5*	5*	37/6	..	2 13 4
Perak Hydro-elec.	6	7	14/6	−1/6	—
Tokyo Elec. 6%	6	6	34½	−11	—
VictoriaFallsPower	15	15	5½	−¼	2 15 7
Whitehall Inv. Pref.	—	6	26/9xd	..	4 9 9

Company	Dividend Previous	Dividend Last	Middle Price Mar. 22	Month's Rise or Fall	Yield £ s. d.
Equipment and Manufacturing					
Aron Elec. Ord.	10	15	65/6	..	4 11 6
Assoc. Brit. Eng.	6	7	47/6	−4	2 14 4
Assoc. Elec.:					
Ord.	10	10	59/–	+6d.	3 5 7
Pref.	8	8	41/3	+1/6	3 17 8
AutomaticTel.&El.	12½	12½	68/6	−1/6	3 12 0
Babcock & Wilcox	11	12	60/–	..	4 0 0
British Aluminium	10	8	38/6	−6d.	4 3 1
British Insulated & Callender's	..	..	46/6	+6d.	—
British Thermostat (5/–)	18½	18½	23/–	..	4 0 5
BritishVac.Cleaner (5/–)	30	30	38/–	..	3 9 0
Brush Ord. (5/–)	9	10	11/6	+9d.	4 7 0
Burco (5/–)	15	20	21/6	..	4 13 0
ChlorideEl.Storage	15	15	87/6	..	3 8 6
Christy Bros.	12½	17½	78/9	..	4 8 10
Cole, E. K. (5/–)	20	20	32/6	+¼	3 1 6
Consolidated Sig.	24	27½	6⅝	−⅛	4 3 3
Cossor, A. C. (5/–)	10*	12½*	40/9	−1/9	1 10 2
Crabtree (10/–)	17½	17½	46/–	..	3 16 1
Crompton Parkinson Ord. (5/–)	22½	22½	30/6	..	3 13 9
De La Rue	40	40	10½	−⅜	3 16 4
Decca (1/–)	100	112	61/3	−⅓	1 16 6
E.M.I. (10/–)	8	8	31/6	−1/–	2 10 9
Elec.Construction	10	12½	60/–	−1/–	4 3 4
Enfield Cable Ord.	12½	12½	64/3	+1/9	3 18 2
English Electric	10	10	55/–	+6d.	3 12 9
Ericsson Tel. (5/–)	22*	20*	53/9	+½	1 17 4
Ever Ready (5/–)	40	40	49/–	+1/6	4 1 6
Falk Stadelmann	7½	10	43/–	+6d.	4 13 0
Ferranti Pref.	7	7	34/6	..	4 1 2
G.E.C.:					
Pref.	6½	6½	34/–	..	3 16 4
Ord.	17½	17½	94/–	..	3 14 5
GeneralCable(5/–)	15	15	18/–	..	4 3 4
Greenwood&Batley	15	15	47/6	+½	6 6 1
H.T.A. (10/–)	12½	12½	28/–	..	4 9 3
Henley's (5/–)	20	20	27/6	−6d.	3 14 1
4½% Pref.	4½	4½	24/9	..	3 13 0
Hopkinsons	17½	20	92/6	+¼	4 6 7
India Rubber Pref.	5½	5½	25/6	..	4 9 9
Intl. Combustion	30	32½	8⅞	+⅞	3 19 3
Johnson & Phillips	15	15	82/6	+1/6	3 12 10
LancashireDynamo	22½	22½	5½xd	..	4 1 9
Laurence,Scott(5/–)	12½	12½	13/9	..	4 11 0
London Elec. Wire	7½	7½	40/6	..	3 14 0
Mather & Platt	10	10	53/–	..	3 15 6
Metal Industries(B)	8½	9	49/–	+1/6	3 13 6
Met.Elec.CablePref.	5½	5½	21/3	..	5 3 6
Mid. Elec. Mfg.	25	25	8	+½	3 2 6
Murex	20	20	95/–	..	4 4 2
Newman Ind.(2/–)	20	20	9/3	..	4 6 7
Philco (2/–)	25	10	11/3	..	1 15 6
Power Securities	6	6	29/–	+6d.	4 2 9
Pye Deferred(5/–)	25	25	38/9	+2/3	3 9 1
Radio & Tel. (2/–)	25	10	10/6	−6d.	1 18 0
Revo (10/–)	17½	17½	49/6	−6d.	3 10 6

(*Continued on next page*)

* Dividends are paid free of Income Tax.

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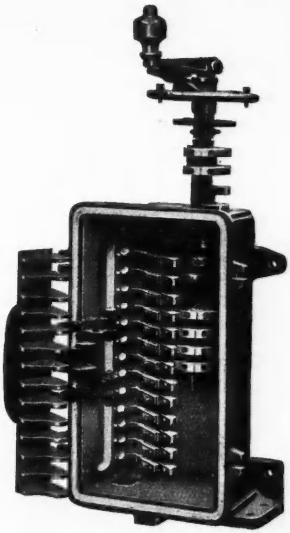

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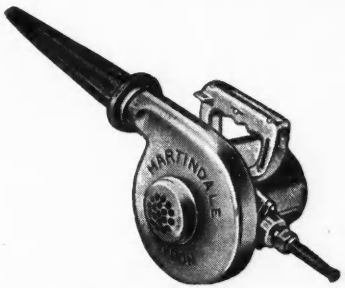

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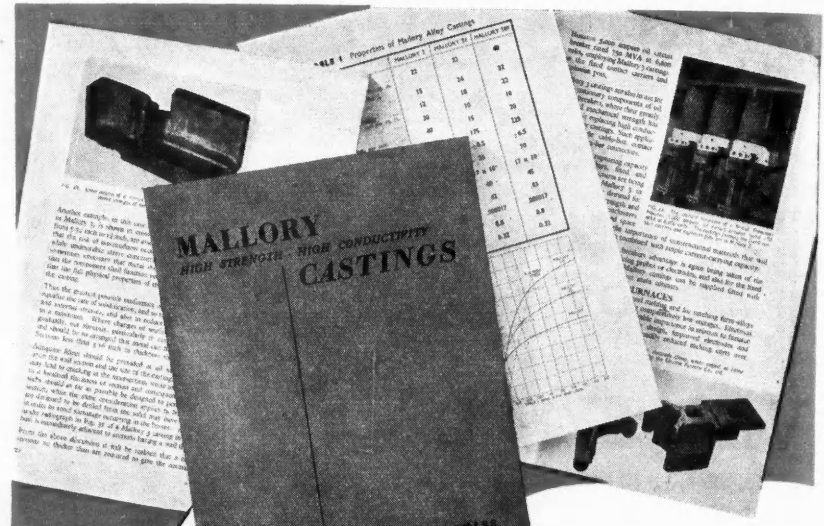

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This 28-page booklet describes the properties and applications of Mallory Castings. It explains how the development of Mallory high conductivity copper alloys has provided electrical engineers with cast materials that retain the high current-carrying capacity of copper, but combine with it the strength and hardness of steel. A copy of the booklet will be sent free on request. It explains how by using Mallory Castings, the designer is given a freer hand by the removal of the limitations common to the older cast materials.

CONTENTS

Properties of Mallory Alloys
Applications of Mallory Castings
Considerations in the Design of Castings
Workshop Practice with Mallory Castings
Mallory Alloy Forgings
Bibliography

MALLORY

MALLORY METALLURGICAL PRODUCTS LIMITED
An Associate Company of Johnson, Matthey & Co. Ltd.
78 Hatton Garden, London, E.C.1. Telephone : HOLborn 5027

Company	Dividend Previous	Dividend Last	Middle Price Mar. 22	Month's Rise or Fall	Yield p.c. £ s. d.
Equipment and Manufacturing *(Continued)*					
Reyrolle ..	12½	12½	74/6	..	3 7 2
Siemens Ord. ..	7½	7½	41/-	+1/6	3 13 2
Strand Elec. (5/-)	10	12½	11/6	+3d.	5 8 8
Switchgear & Cowans (5/-) ..	20	20	23/9	+⅛	4 4 2
T.C.C. (10/-) ..	7½	10	24/-	..	4 3 4
T.C. & M. ..	10	10	60/-	+1/-	3 6 8
TelephoneMfg.(5/-)	9	9	13/-	−3d.	3 9 3
Thorn Elec. (5/-)	20	20	30/6	−1/-	3 5 6
Tube Investments	20	22½	6⅛	..	3 14 0
Vactric (5/-) ..	Nil	22½	20/9	−1/9	5 8 3
Veritys (5/-) ..	7½	7½	8/6	..	4 8 3
WalsallCondnits(4/-)	55	55	54/6	..	4 0 9
Ward & Goldstone (5/-)	20	25	34/6	..	3 12 6
WestinghouseBrake	14	14	74/-	+1/-	3 15 9
West, Allen (5/-)	7½	7½	8/9	−3d.	4 5 9
Traction and Transport					
Anglo-Arg. Trans.:					
First Pref. (£5)	Nil	Nil	1/9	+3d.	—
4% Inc. ..	Nil	Nil	3½	−1	—
Brit.Elec.Traction:					
Def. Ord. ..	45	45	1075	+25	4 3 9
Pref. Ord. ..	8	8	173	..	4 12 6
Bristol Trams ..	10	10	49/-	−6d.	4 1 8
Brazil Traction ..	2	2	29½	−1½	6 15 7
Calcutta Trams ..	6½	7½	65/6	+4/-	2 5 9
Cape Elec. Trams	5	6	30/6	+1/-	3 18 8
Lancs. Transport	10	10	43/6	..	4 12 0
Southern Rly.:					
5% Prefd. ..	5	5	74½	+1½	6 14 3
5% Pref. ..	5	5	110½	+2½	4 10 4
T. Tilling ..	10	10	52/-	+⅛	3 17 0
West Riding ..	10	10	43/9	..	4 11 4
Telegraph and Telephone					
Anglo-Am. Tel.:					
Pref.	6	6	126½	+1	4 14 1
Def.	1½	1½	32½	..	4 12 4
Anglo-Portuguese	8	8	28/6	−6d.	5 12 4
Cable & Wireless:					
5½ Pref. ..	5½	5½	112	−2	4 19 3
Ord.	4	4	95½	−4½	4 3 9
CanadianMarconi	$1 Nil	4 cts.	18/-	−2/-	—
Globe Tel. & Tel.:					
Ord.	8½*	5*	43/-	−1/-	2 6 6
Pref.	6	6	32/-	+6d.	3 15 0
Great Northern Tel. (£10)	Nil	Nil	28½	−2	—
Inter. Tel. & Tel.	Nil	Nil	29	−4	—
Marconi-Marine ..	7½	7½	33/6	+6d.	4 8 7
Oriental Tel. Ord.	4	4	57/6	−7/-	—
Telephone Props.	Nil	6	20/6	−1/6	5 17 1
Tele.Rentals(5/-)	10	10	12/9	−6d.	3 18 6

* Dividends are paid free of Income Tax.

Stocks and Shares (*Continued from page 511*)

year at 10 per cent. Final accounts of Automatic Telephone & Electric have been delayed until the consolidated figures have been prepared. The price at 68s. 6d. is 1s. 6d. lower.

E.M.I. Interests

The E.M.I. company owned the share capital of Rudge Whitworth, Ltd., but sold it in 1943 to the Raleigh Cycle Co. The present business is mainly (and normally) concerned with wireless receiving set manufacture and it also produces domestic electrical appliances. E.M.I. controls various gramophone and kindred undertakings, and also, jointly with Marconi's Wireless Telegraph Co., the Marconi E.M.I. Television Co., Ltd. At the present price, the shares yield a modest £2 10s. 9d. per cent on the money, but E.M.I. is regarded as being one of the foremost companies in the television industry. As soon as the company gets a fair chance of developing its energies, the profits are expected to expand considerably.

Victoria Falls and Transvaal Power

On various occasions attention has been drawn here to the fact that in two years' time the South African Government has the right to give two years' notice to expropriate the company's properties on payment of fair compensation. If this were to be exercised, the preference shares might conceivably become repayable at their par price of 20s. This uncertainty has restrained investment from employing money in the preference shares, which, for years past, have been receiving 10 per cent per annum and give at the present 26s. 6d. the generous yield of 7½ per cent on the money. If it should happen that in 1950 the shares are paid off at 20s., the loss of capital would hardly be compensated for by the good yield now obtainable.

B.E.T. Assets

Estimates of the actual break-up value have been responsible for a recent revival of interest in B.E.T. deferred stock. Calculations of this sort are given point by the assumption that, if the resistance movement against nationalization of the electricity supply and transport systems fails, a large part of the B.E.T. Company's interests will pass to the Government, with due compensation. Containing a large amount of guesswork about the current value of the investments, unofficial estimates of the company's assets give the deferred stock a value appreciably better than the present market price.

Nationalization and compensation would, of course, involve many other considerations; but the present strength of the market suggests that asset values are considered to carry substantial weight. The form in which B.E.T. deferred stock is quoted is not popular with the ordinary investor. He feels more at home with a 5s. share standing at 50s., than with £100 stock at 1,000. However, the stock is transferable in multiples of a penny. The last dividend was 45 per cent.

D†

NEW PATENTS

Electrical Specifications Recently Published

The numbers under which the specifications will be printed and abridged are given in parentheses. Copies of any specification (1*s. each*) *may be obtained from the Patent Office*, 25, *Southampton Buildings, London, W.C.*2.

AKT. GES. BROWN, Boveri & Cie.—"Ultra-high-temperature turbine plant." 6570/44. December 12th, 1942. (575812.) "Current transformer for very high voltage." 7431/44. May 10th, 1943. (575886.)

Aktiebolaget Elektrolux.—"Filters particularly for vacuum cleaners." 7306/44. May 14th, 1943. (575877.)

Arrow Electric Switches, Ltd.—"Spring mounting and assembly for snap-action electric switches." 6315/44. April 12th, 1943. (575788.)

British Thomson-Houston Co., Ltd.—"Thermostatic switches." 6360/44. April 10th, 1943. (575789.) "Refrigerators." 6432/44. April 10th, 1943. (575794.) "Electric brake systems." 6803/44. April 16th, 1943. (575822.) "Electric switches with electrodynamically-reinforced contact." 6805/44. April 16th, 1943. (575823.) "Electric circuit-breakers having arc-extinguishing devices." 7035/44. April 17th, 1943. (575855.) "Electrical contacts and methods of producing them." 7542/44. April 24th, 1943. (575888.) "Electromagnetically operated electric switches or contactors having pivoted armatures." 7543/44. April 26th, 1943. (575889.)

A. Combi.—"Electrical switches or circuit-breakers." 7293. April 20th, 1944. (575875.)

Elliott Bros. (London), Ltd., and H. D. Hawkes.—"Apparatus for testing the magnetic properties of materials." 7065. April 17th, 1944. (575856.)

Fairey Aviation Co., Ltd., and F. L. Ebel.—"Means for securing electric conductors and the like to a wall or similar support." 7323. April 20th, 1944. (575879.)

Ferguson, Pailin, Ltd., F. Grunewald and E. M. Dakin.—"Gas-blast high-voltage electric circuit-breakers." 7521. April 22nd, 1944. (575887.)

General Electric Co., Ltd., and L. H. Carmalt.—"Steamer boilers fed from ball-tap tanks." 2910. February 22nd, 1943. (575892.)

General Electric Co., Ltd., and M. W. Peirce.—"Dust-proof electric lighting installations." 7565. April 24th, 1944. (575890.)

H. H. Gordon (Allmanna Svenska Elektriska Aktiebolaget).—"Air-blast electric circuit-breakers." 7034. April 17th, 1944. (575854.)

Jack & Heintz, Inc.—"Overspeed preventing mechanism for electric motors." 6378/44. February 18th, 1943. (575792.)

H. W. K. Jennings (B. F. Sturtevant Co.).—"Centrifugal fans." 7073. April 17th, 1944. (575909.)

Pressed Steel Co., Ltd., E. G. Rowledge and W. G. Nolcken.—"Refrigerating systems." 7411. April 21st, 1944. (575884.)

D. L. Raitt.—"Electric lamp holders." 7169. April 18th, 1944. (575864.)

A. I. Rochmann.—"Electric heating elements." 6821. April 13th, 1944. (575840.)

D. Rushworth.—"Cable reels." 724. January 14th, 1944. (575779.)

F. S. Sander.—"Connecting clamps for connecting wire loops." 5013/44. May 28th, 1943. (575782.)

Siemens Electric Lamps & Supplies, Ltd., and J. N. Aldington.—"Starting arrangements for electric discharge lamps." 6095. April 1st, 1944. (575835.)

Standard Telephones & Cables, Ltd., and G. Gilliver.—"Electric welding apparatus." 7410. April 21st, 1944. (575883.)

Standard Telephones & Cables, Ltd., and T. W. Wingent.—"Methods of making metal to glass seals." 6814. April 13th, 1944. (575824.)

Svenska Turbinfabriks Aktiebolaget Ljungstrom.—"Safety devices for radial flow elastic fluid turbines." 6667/44. July 9th, 1943. (575815.)

M. Tama and M. Tama.—"Submerged resistor type induction furnace for melting metals." 2066/44. July 1st, 1943. (575780.)

B. Tenenbaum.—"Piezo-electric crystals." 6493. April 6th, 1944. (575805.)

F. W. Thorpe, Ltd., and F. W. Thorpe.—"Reflectors of electric light fittings." 6312. April 5th, 1944. (575787.) "Fittings of fluorescent electric lamps." 6711. April 12th, 1944. (575817.)

W. Wadsworth & Sons, Ltd., W. H. Kerse and H. J. Disley.—"Electric switches of the mercury type." 6372. April 5th, 1944. (575791.)

J. E. Wildbore.—"Means for the suspension of pendant electric light fittings." 6545. April 7th, 1944. (575810.)

Irish Electrical Imports

FROM the official returns now available we have compiled the appended table showing the imports of electrical machinery and cognate materials into Eire during last year as compared with 1944. As will be seen, the trade more than trebled, a total of £742,846 having been attained as compared with only £241,325 in 1944.

Class	1944 £	1945 £
Electric motors	10,196	27,187
Electric measuring instruments and apparatus	12,467	19,135
Other electrical apparatus	29,430	104,709
Vacuum cleaners	—	12,273
Dry batteries and parts	6,639	18,828
Electric fires, kettles and irons, etc.	5,104	16,194
Electric lamp bulbs	5,260	54,542
Electric wires and cables	12,305	92,809
Electric copper wire (uninsulated)	6,222	49,284
Electric lighting accessories and fittings	14,543	45,487
Electric cooking apparatus and parts	2,654	5,403
Telegraph and telephone apparatus	9,543	49,677
Wireless sets, apparatus and components	23,530	82,009
Other electrical goods and apparatus	103,432	165,309
Total	£241,325	£742,846

CONTRACT INFORMATION

Accepted Tenders and Prospective Electrical Work

Contracts Open

Where "Contracts Open" are advertised in our "Official Notices" section the date of the issue is given in parentheses.

Australia.—May 2nd. Western Australian Government Tramways. Fifty 6-wheel trolley-bus chassis, fittings, etc.

Bromley.—April 10th. Electricity Department. Cables and transformers. (March 22nd.)

Egypt.—Ministry of Works. Supply, delivery, erection and maintenance of hydro-electric generating plant at Aswan. Specifications (£E100 for two copies) from Kennedy & Donkin, 12, Caxton Street, London, S.W.1.

Eire.—May 1st. Electricity Supply Board Steam station, Portarlington. P. J. Dempsey, clerk and secretary. Electricity Supply Board 60-62, Upper Mount Street, Dublin.

Hastings.—April 15th. Electricity Department. One 11-kV three-phase outdoor type switch kiosk. (See this issue.)

Kesteven.—April 5th. County Council. Electrical installations at the Public Assistance Institution, Grantham. (March 15th.)

Kettering.—April 29th. Electricity Department. One 400-kVA, one 350-kVA, one 6,000-kVA and two 500-kVA transformers. (See this issue.)

Leeds.—May 4th. Transport Committee. Automatic mercury arc rectifier equipment, with switchgear. (See this issue.)

Manchester.—April 5th. Electricity Department. Cables and service cut-outs for twelve months. (March 22nd.)

April 8th. Street lanterns and electricity meters for twelve months. (See this issue.)

New Mills.—April 19th. Electricity Department. L.v. cables and feeder pillars. (See this issue.)

North of Scotland.—April 5th. Hydro-Electric Board. H.v. and l.v. overhead lines in the Isle of Skye. (March 15th.)

April 22nd. Submarine power cables in Bute and South Cowal area. (See this issue.)

Rotherham.—April 20th. R.D.C. Electrical wiring of the Council's houses. (See this issue.)

Rugby.—April 12th. Electricity Department. Electrical stores and materials. (See this issue.)

Southend-on-Sea.—April 11th. Corporation. One 250-kW back pressure steam generating/alternator set. (See this issue.)

Weymouth.—April 16th. Electricity Department. Overhead lines and underground cable, pole-mounting switchgear, transformers and l.v. overhead lines. (March 15th.)

Orders Placed

Auchterarder (Perthshire).—Town Council. Accepted. Electric lighting in housing scheme (£810).—Colquhoun & McArthur.

Bedford.—Electricity Committee. Accepted. Steel columns and brackets (£1,291).—Revo Electric Co. Lanterns (£658).—G.E.C. Cables for three years.—Siemens Bros. & Co. and British Insulated Callender's Cables. Two battery chargers (£476).—A. Reyrolle & Co.

Billingham-on-Tees.—Urban District Council. Accepted. Converting 400 houses from gas to electricity (£3,676).—W. Stewart & Sons.

Cheshire.—Health Committee. Accepted. 144 wireless headphones for institution (£146).—Ericsson Telephones.

Croydon.—Electricity Committee. Recommended. Four boilers and ancillary plant for new power station.—Simon-Carves.

Fulham.—Electricity Committee. Accepted. Street lighting fittings.—Cromwell Road extension (£542).—G.E.C.

Hereford.—Gas Committee. Accepted. Switchboard at gasworks (£423).—Drake & Gorham.

Islington.—Electricity Committee. Recommended for twelve months: Transformers.—Hackbridge Electric Construction Co.; British Electric Transformer Co.; Lindley Thompson Transformer & Service Co. Transformer tanks.—Alfred Allen & Son. Tinned copper wire and fuses.—Lighting, Heating & Traction Supplies Co. Boxes.—Aero Engines; British Insulated Callender's Cables; W. T. Henley's; W. Lucy & Co.; Siemens Bros. Meters.—Metropolitan-Vickers; Aron Electricity Meter; Sangamo Weston. Lamps, etc.—B.T.H. Co.; Philips Lamps; Crompton Parkinson; G.E.C.; Ensign Lamps. Cable Covers.—Cable Covers, Ltd. Compound.—Dussek Bitumen & Taroleum. Tapes.—L. Andrew & Co. Cables.—Aberdare Cables; Britannic Electric Cable & Construction Co.; Ediswan Cables; Telegraph Construction & Maintenance Co.; British Insulated Callender's Cables.

Salford.—Corporation Purchasing Committee. Recommended. Paper-insulated cables for a further year to March 31st, 1947.—Aberdare Cables and Lancashire Cables.

Seaham (Durham).—Urban District Council. Accepted. Cables for the Stockton Road housing estate.—Edison Swan Cables.

South Shields.—Town Council. Accepted. Tenders in connection with extensions to the trolley-bus service:—Overhead fittings (£1,080)—Anti-Attrition Co. Section pillars and insulators (£350)—B.I. Callender's.

Contracts in Prospect

Particulars of new works and building schemes for the use of electrical installation contractors and traders. Publication in this section is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

Airdrie.—Buildings, including switch rooms, for North-West Rivet Bolt and Nut Factory; manager.

Aldershot.—Houses (33), Aldershot Park; F. Battersbury, borough engineer.

Atherstone.—Houses (58), Atherstone and Polesworth, for R.D.C.; H. N. Jepson, architect, Midland Bank Chambers, Nuneaton.

Belfast.—Extensions to hospital for children, Greenisland (£30,000); city surveyor.

Billingham-on-Tees.—Houses (74), Junction site, for U.D.C.; Kitching & Co., 40, Albert Road, Middlesbrough.

Catford.—Flats (32), Belmont Grove; Henry Kent (Builders), Ltd.

Dalkeith.—Houses (64), electrical; Morham & Brotchie, 29, Hanover Street, Edinburgh, surveyors.

Darlington.—Houses (104), Brankin Moor site; E. Lawson, Ltd., builders.

Eastbourne.—Houses (30), Astaire Avenue, Northbourne Road; borough engineer, Bishopbourne, Carlisle Road.

Ennerdale.—Houses (191), on five sites; R.D.C. surveyor, Council Offices, Egremont.

Frimley and Camberley.—Permanent houses (54), Crabtree Road; A. L. Farman, architect, 42, Richmond Park Road, London, S.W.14.

Gloucestershire.—Junior and infants' school, Brimscombe and Thrupp (£25,200); county architect, Shire Hall, Gloucester.

Guildford.—Houses (178), Worplesdon, Normandy, West Horsley and Gomshall, for R.D.C.; J. W. Wilton, surveyor, Millmead House.

Islington.—Tenements, shops and communal buildings, Essex Road estate (£216,206); A. Roberts & Co., Ltd.

Jedburgh.—Houses (100); burgh surveyor.

Kendal.—Permanent houses (30); J. W. Tonge, borough engineer, Municipal Offices.

Kent.—Extensions, County Hospital, Dartford (£68,900); county architect, Maidstone.

Kirkwall.—Houses (22), town clerk, Town Hall.

Lancashire.—Convalescent home, Singleton Park, near Blackpool (£7,750); county architect.

Lewisham.—Extensions, Westside Road depot (£33,000); borough engineer.

Llandilo.—Permanent houses (36), for R.D.C.; R. P. Walters, surveyor, Council Offices, Crescent Road.

Longbenton (Northumberland).—Houses (76), Forest Hall, for U.D.C.; surveyor, U.D.C. offices.

Lowestoft.—Houses (250); Hipperson & Son, Ltd.

Ludlow.—Permanent houses (56), for R.D.C.; A. E. Wilson, Clifton Buildings, Old Street.

Newbiggin (Northumberland).—Houses (250), north of Seaton Village; J. Kailofer, U.D.C. surveyor.

Newcastle-on-Tyne.—Works canteen, Presco, Ltd., Cheraton Street, Newcastle; Richardson Construction Co., Liverpool Street.

Houses (36), Silverhill Drive; city architect, 18, Cloth Market.

Substation, Welbeck Road, for the Northern Rediffusion Co.; C. Newcombe, Eldon Square.

North Riding (Yorks).—School kitchen, Brawby; dining centre, Redcar; canteen, Newby Wiske; county architect, County Hall, Northallerton.

Notts.—Dining rooms and kitchens, Lowdham and Mansfield Woodhouse schools; county architect.

Risca (Mon.).—Houses (52), Gelli Pistyll site; surveyor, Council Offices.

Swansea.—Works extensions, Unit Works, Strand; Unit Superheater Co., Ltd.

Factory, Ystrad Road, Fforestfach; Louis Marx & Co., Ltd.

Torquay.—Holiday camp, Maidencombe; borough engineer.

Wanstead and Woodford.—Civil centre; town clerk, Municipal Offices, Woodford, London, E.18.

York.—Houses (146), Carr estate and Lindsey Avenue (£163,348); Ainstey Building Estates, Ltd., Beckfield Lane, Acomb.

TRADE MARKS

APPLICATIONS have been made for the registration of the following trade marks. Objections to any of them must be made within one month from the dates mentioned :—

March 13th

ADMIRAL. Class 9. No. 628,499. Talking machines, gramophone record players and changers, gramophone records, photo-electrically and electronically operated alarms, electric curling irons, electric flat irons and high-frequency electrical apparatus (not included in other classes).—Admiral Corporation, Chicago. Address for service: c/o Stevens, Langner, Parry & Rollinson, 5-9, Quality Court, Chancery Lane, W.C.2.

INVICTA. Class 9, No. 636,804. Scientific, nautical, telegraphic, telephonic, television, radio and acoustic instruments and parts thereof not included in other classes; gramophone pick-ups, wireless aerials and electric accumulators and batteries.—Invicta Radio, Ltd., St. Andrews Road, Cambridge.

LECOLINE. Class 9. No. 637,953. Insulated wire (electric) and cables for electric transmission systems and for electric transmitting apparatus.—Liverpool Electric Cable Co., Ltd., 24, Queen Anne's Gate, Westminster, S.W.1.

PRESMETIC. Class 11, No. 637,832. Refrigerating machines and parts thereof not included in other classes.—Pressed Steel Co., Ltd., Cowley, Oxford.

PERMALI (design.) Class 17, No. 637,746. Insulators and insulating materials all for sale in the United Kingdom or export to the British Empire, but not including electric insulators of ceramic material.—New Insulation Co., Ltd., 125, Bristol Road, Gloucester.

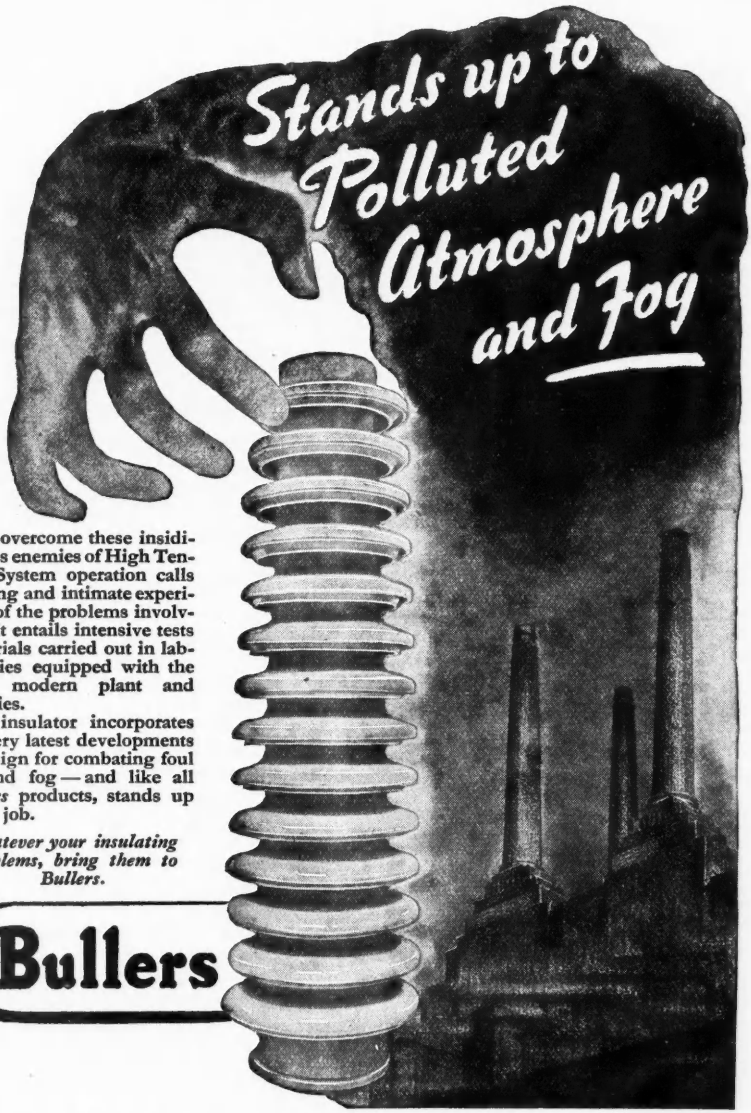
March 20th

DRYMAT. Class 9. No. 637,995. Electrical apparatus for blowing, exhausting, extracting and removing dust, and parts thereof not included in other classes.—Dallow, Lambert & Co., Ltd., 3, Spalding Street, Leicester.

STRIPTIC. Class 9. No. 638,369. Insulated electric conductors and insulated electric cables. —Reliance Electrical Wire Co., Ltd., Fingal Works, Staffa Road, Leyton, E.10.

MARY ANN (design). Class 11. No. 638,276. Electric heating apparatus and refrigerators.—British Electric Domestic Appliances (1938), Ltd., 105-109, Judd Street, W.C.1.

Stands up to Polluted Atmosphere and Fog



TO overcome these insidious enemies of High Tension System operation calls for long and intimate experience of the problems involved. It entails intensive tests and trials carried out in laboratories equipped with the most modern plant and facilities.

This insulator incorporates the very latest developments in design for combating foul air and fog — and like all *Bullers* products, stands up to its job.

Whatever your insulating problems, bring them to Bullers.

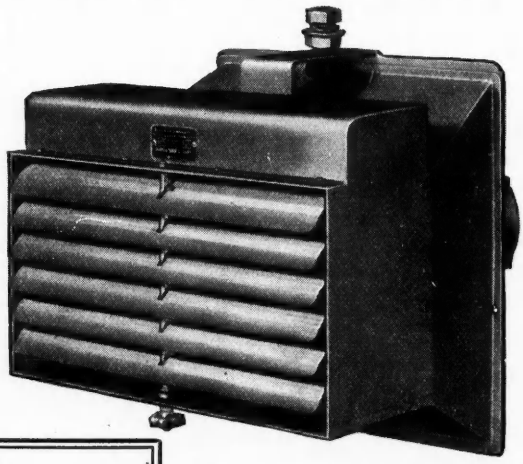
Bullers

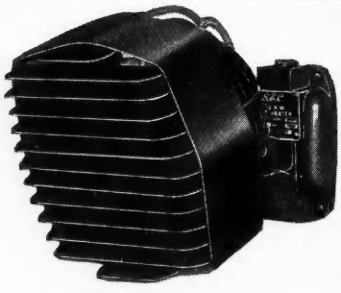
BULLERS LTD., 6, Laurence Pountney Hill, London, E.C.4. Phone: Mansion House 9971 (3 lines
Telegrams: "Bullers, Cannon, London" Manchester Office: 196, Deansgate, Manchester

G.E.C.

ELECTRIC UNIT HEATERS

A wartime development which has come to stay





The 2½ kW UNIT

just as simple to install, easily adjustable for direction of warm air flow. Runs almost noiselessly. Size approx. 9″ x 11¾″. Finished metallic bronze cellulose.

5 to 20 kW IN THIS TYPE

Numerous works and factories have been comfortably, conveniently and economically heated with these units.

They need no floor space, no boiler house, no fuel, no labour.

In relation to heat output they are of the smallest size and use the least metal.

Lowest capital cost.

Low operating costs.

Each unit can be worked independently with or without thermostatic control.

Advt. of The General Electric Co. Ltd., Head Office, Magnet House, Kingsway, London, W.C.2.

CLASSIFIED ADVERTISEMENTS

ADVERTISEMENTS for insertion in the following Friday's issue are accepted up to **First Post on Monday,** at Dorset House, Stamford Street, London, S.E.1.

THE CHARGE for advertisements in this section is 2/- per line (approx. 7 words) per insertion; ***ONLY OFFICIAL AND GOVERNMENT ANNOUNCEMENTS CAN NOW BE DISPLAYED:***—30/- per inch. Where the advertisement includes a Box Number this counts as six words and there is an additional charge of 6d. for postage of replies.

SITUATIONS WANTED.—Three insertions under this heading can be obtained for the price of two if ordered and prepaid with the first insertion.

REPLIES TO advertisements published under a Box Number if not to be delivered to any particular firm or individual should be accompanied by instructions to this effect, addressed to the Manager of the ELECTRICAL REVIEW. Letters of applicants in such cases cannot be returned to them. The name of an advertiser using a Box Number will not be disclosed. All replies to Box Numbers should be addressed to the Box Number in the advertisement, c/o ELECTRICAL REVIEW, Dorset House, Stamford Street, London, S.E.1. Cheques and Postal Orders should be made payable to ELECTRICAL REVIEW LTD. and crossed.

Original testimonials should not be sent with applications for employment.

OFFICIAL NOTICES, TENDERS, ETC.

ROTHERHAM RURAL DISTRICT COUNCIL

To Electrical Contractors

THE Rotherham Rural District Council invite tenders for the Electrical Wiring of the Council's houses in the various parishes of the Rotherham Rural Area, as specified in the schedules prepared, of which there are 193 houses to be fully wired, and 168 houses which are partly wired and need additional wiring and fitting with Dual Plugs and Sockets.

Schedules and conditions with specifications, together with a form of tender, may be obtained at the office of the Maintenance Clerk of Works, John E. Nicholson, 4, South Terrace, Moorgate, Rotherham, upon payment of a deposit of £2 2s., which will be refunded on receipt of a bona fide tender accompanied by all the documents relating thereto, and applications for tendering documents must be received before 10 a.m. on Saturday, the 6th April, 1946. Tenders enclosed in an envelope provided for the purpose, which must be properly sealed and endorsed "Tender for Electrical Wiring," should be sent to the undersigned not later than 10 a.m. on Saturday, the 20th April, 1946. The Council do not bind themselves to accept the lowest or any tender.

E. F. L. DANBURY,
Clerk to the Council.

Council Offices,
Grove Rd., Moorgate, Rotherham.
19th March, 1946. 187

BOROUGH OF KETTERING ELECTRICITY DEPT.

TENDERS are invited from British manufacturers for:
Two 500-kVA. ratio 6,600/420-volts Transformers.
One 400-kVA. ratio 11,000/420-volts Transformer.
One 350-kVA. ratio 11,000/420-volts Transformer.
One 6,000-kVA. ratio 33,000/11,000-volts Transformer with automatic tap change equipment.

Specifications and forms of tender, in duplicate, may be obtained from the Borough Electrical Engineer, Rockingham Road, Kettering, upon receipt of one guinea for each specification, which will be refunded upon receipt of a bona fide tender and the return of the specification. Extra copies of the specification may be purchased at a cost of 5s. each. Tenders must be submitted in a plain sealed envelope supplied by the Corporation, endorsed "Tender for Specification No. 105," and must be received by me not later than Monday, 29th April, 1946. The Corporation do not bind themselves to accept the lowest or any tender.

JOHN CHASTON,
Town Clerk.

Town Clerk's Office,
High Street, Kettering.
21st March, 1946. 183

NEW MILLS U.D.C. ELECTRICITY DEPARTMENT

L.T. Cables and Feeder Pillars

THE Council invite tenders for the supply of L.T. Cables and Feeder Pillars. Specification and form of tender may be obtained from Mr. W. Larkum, A.M.I.E.E., Engineer and Manager, Thornfield, Spring Bank, New Mills, near Stockport. Tenders in plain sealed envelopes, endorsed "Tender for Cables," must be received by me not later than 19th April, 1946. The Council do not bind themselves to accept the lowest or any tender.

JOHN WALTON,
Solicitor and Clerk to the Council.

Town Hall, New Mills,
Near Stockport.
20th March, 1946. 160

CITY OF LEEDS

THE Transport Committee of the Leeds City Council invites tenders for supply and erection of Automatic Mercury Arc Rectifier Equipment, with H.T. and L.T. D.C. Switchgear.

Further particulars and forms of tender can be obtained upon application to the undersigned. Sealed tenders in plain envelopes, endorsed on the outside "Transport—Tender for Rectifier Equipment," to be delivered to the Town Clerk, Committee Department, Civic Hall, Leeds, 1, not later than 10 a.m. on Saturday, 4th May, 1946, and remain open for acceptance for six weeks thereafter. The Corporation does not bind itself to accept the lowest or any tender.

W. VANE MORLAND,
M.I.Mech.E., M.I.A.E., M.Inst.T., F.R.S.A.,
General Manager and Chief Engineer.

1, Swinegate,
Leeds, 1.
March, 1946. 175

BOROUGH OF RUGBY ELECTRICITY DEPT.

THE Corporation invite tenders for the supply of:—
(a) L.T. Paper-insulated Cable.
(b) Service Joint Boxes and Cutouts.
(c) Underground Disconnection Link Boxes.
(d) Above-ground Feeder Pillars.
(e) Meter Boards.
(f) Plumbers' Metal and Tinman's Solder.
(g) Bituminous Compound.
(h) Jointing Tapes and Material.

Specifications can be obtained on written application to the Borough Electrical Engineer, 17-18, High St., Rugby. Sealed tenders, endorsed "Tender for ——," must be addressed to the undersigned so as to be received not later than 12 noon, Friday, 12th April, 1946. The Corporation does not bind itself to accept the lowest or any tender.

D. E. BIART,
Town Clerk.

The Lawn, Newbold Rd., Rugby.
23rd March, 1946. 225

COUNTY BOROUGH OF HASTINGS ELECTRICITY DEPARTMENT

Tender for 11-kV, 3-phase Switch Kiosk

TENDERS are invited from Manufacturers for the supply and delivery of an 11-kV, 3-phase outdoor type Switch Kiosk. Specification and form of tender may be obtained from the Borough Electrical Engineer and Manager, Electric House, 12 & 13, York Buildings, Hastings. Tenders enclosed in plain envelopes, endorsed "Electricity Switch Kiosk," should be delivered to the undersigned not later than the first post on Monday, 15th April, 1946.

D. W. JACKSON, Town Clerk.

Town Hall, Hastings. 213

CITY OF MANCHESTER

TENDERS are invited for the supply and delivery, over a period of twelve months, of the following: Street Lanterns, etc. (Specification No. 852); Electricity Meters (Specification No. 853).

Specifications, etc., may be obtained from Mr. R. A. S. Thwaites, Chief Engineer and Manager, Electricity Dept., Town Hall, Manchester, 2. Tenders, addressed to the Chairman of the Electricity Committee, to be delivered not later than 10 o'clock a.m. on Monday, 8th April, 1946.

PHILIP B DINGLE,
Town Clerk.

Town Hall, Manchester, 2.
22nd March, 1946. 221

COUNTY BOROUGH OF SOUTHEND-ON-SEA

TENDERS are invited for the supply, delivery and erection at the Southend-on-Sea Municipal Hospital, Rochford, Essex, of the following: One 250-kW Back Pressure Steam Generating/Alternator Set.

Specification and form of tender may be obtained on application to the Borough Engineer and Surveyor at the under-mentioned address. Tenders, in sealed envelopes endorsed "Tender for Electric Generating Set," but not bearing any name or mark indicating the sender, should be delivered to the undersigned not later than 9 a.m. on Thursday, 11th April, 1946. The Corporation do not bind themselves to accept the lowest or any tender.

ARCHIBALD GLEN,
Town Clerk.

Municipal Buildings,
Clarence Road, Southend-on-Sea.
20th March, 1946. 192

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

Distribution Scheme No. 4—Submarine Power Cables in Bute and South Cowal Area

THE Board invite tenders for the manufacture, supply, delivery and installation of submarine power cables. Copies of the specification and form of tender may be obtained from the Offices of the Board on application to the undersigned, on payment of a deposit of One Guinea, which will be refunded on receipt of a bona fide tender.

Tenders must be delivered to the Offices of the Board not later than 22nd April, 1946. The Board do not bind themselves to accept the lowest or any tender.

T. LAWRIE,
Secretary.

16, Rothesay Terrace,
Edinburgh, 3.
18th March, 1946. 240

SITUATIONS VACANT

ADWICK-LE-STREET URBAN DISTRICT COUNCIL

Appointment of Electrical Engineer and Manager

APPLICATIONS are invited for the appointment of Electrical Engineer and Manager. Salary in accordance with Agreement respecting salaries of Electrical Engineers made by the National Joint Council of Local Authorities and Chief Electrical Engineers for the Electricity Supply Industry, commencing at 85% of schedule for first year, 92½% for second year, rising to full salary at commencement of third year. Present full scale salary £533 plus temporary cost of living bonus and car allowance.

Candidates must be fully qualified Electrical Engineers and have had practical experience in the administration and management of an Electricity Supply Undertaking. The appointment is subject to the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination. Closing date for receipt of applications, 13th April, 1946. Applications, on the prescribed form, with copies of not more than three testimonials, to be forwarded in a sealed envelope, endorsed "Electrical Engineer and Manager," to the undersigned.

C. R. MARSHALL,
Clerk of the Council.

Council Offices,
Adwick-le-Street, nr. Doncaster. 174

COUNTY BOROUGH OF ST. HELENS ELECTRICITY DEPARTMENT

Appointment of Consumers' Engineer

APPLICATIONS are invited for the above position with salary and conditions in accordance with Grade 4, Class G, of the National Joint Board Schedule, at present £573 per annum.

Candidates must have had considerable experience in all branches of the Consumers' Department of a large Electricity Undertaking, and must be Corporate Members of the Institution of Electrical Engineers. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination.

Application forms and particulars of the duties appertaining to the appointment may be obtained from the undersigned. Applications must be received not later than the first post on 15th April, 1946, endorsed "Consumers' Engineer."

P. BREGAZZI,
Engineer and Manager.

Electricity Works,
Carlton Street, St. Helens, Lancs.
March 21st, 1946. 204

CITY OF CHESTER ELECTRICITY DEPT.

APPLICATIONS are invited for the following appointments:—

(1) JUNIOR ASSISTANT MECHANICAL AND ELECTRICAL ENGINEER. Applicants must have had a first-class education and technical and practical experience in the design, manufacture, erection and maintenance of equipment employed in modern substations connected with generating stations and taking bulk supply from the Central Electricity Board, and in the supply of E.H.T. and L.T. underground and overhead electric lines employed for transmission and distribution. Applicants must have served a workshop apprenticeship and gained technical qualifications equivalent to Higher National Certificate in Electrical Engineering, and be Graduate or Corporate Members of the Institution of Electrical Engineers. The salary will be in accordance with the National Joint Board Schedule, Class F, Grade 8a, commencing at £371 p.a.

(2) JUNIOR UNDERGROUND MAINS ENGINEER. The person appointed will be required to act as assistant to the Council's Senior Underground Mains Engineer. Applicants must have had a first-class technical education and technical and practical experience in the design of networks for the transmission and distribution of electricity, the laying and maintenance of E.H.T. and L.T. underground cables in urban and rural areas, and street lighting. They must also have had experience in the compiling of records and statisitcs and in the organization of labour and transport. Applicants must have technical qualifications equivalent to the Higher National Certificate in Electrical Engineering and be Graduate or Corporate Members of the Institution of Electrical Engineers. The salary will be in accordance with the National Joint Board Schedule, Class F, Grade 8b, commencing at £346 p.a.

(3) JUNIOR OVERHEAD LINES ENGINEER. The person appointed will be required to act as assistant to the Council's Senior Overhead Lines Engineer. Applicants must have had a first-class technical education and technical and practical experience in the design, erection and maintenance of E.H.T. and L.T. overhead lines employed for the transmission and distribution of electricity in extensive rural areas. They must also have had experience in the compiling of records and statistics and in the organization of labour and transport. Applicants must be Graduate or Corporate Members of the Institution of Electrical Engineers. The salary will be in accordance with the National Joint Board Schedule, Class F, Grade 8b, commencing at £346 per annum.

The successful candidates will be required to pass a medical examination and to contribute to the Council's Superannuation Fund. Applications, on a form to be obtained from the Town Clerk, must be sent in an envelope endorsed "Electricity Department Appointments" so as to reach the undersigned not later than Saturday, the 13th April, 1946. Canvassing, directly or indirectly, will disqualify, and any relationship to officers or members of the Council must be disclosed.

G. BURKINSHAW,
Town Clerk.

Town Hall, Chester.
28th March, 1946. 234

BOROUGH OF TORQUAY ELECTRICITY UNDERTAKING

Appointment of Distribution Engineer

APPLICATIONS are invited for the position of Distribution Engineer. Candidates are required to hold a University Degree in Electrical or Mechanical Engineering, or its equivalent, and to be Graduates or Corporate Members of the Institution of Electrical Engineers. They must possess the experience necessary for the administration, operation and maintenance of an extensive transmission and distribution system, covering urban and rural districts, and for the construction of overhead lines and substations and the laying of underground cables operating at pressures up to 33 kV.

Salary and conditions of service would be in accordance with Grade 3, Class G, of the N.J.B. Schedule; salary at present £621 per annum.

The appointment would be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate would be required to pass a medical examination and to own an approved car, for which an allowance will be made under the Council's scale. Applications, endorsed "Distribution Engineer," stating age, qualifications and experience, with supporting testimonials or references, should be submitted to the Borough Electrical Engineer and Manager, Electric House, Torquay, and received by him on or before 29th June, 1946.

H. A. HIELD, Town Clerk.

Town Hall, Torquay. 152

SOUTHERN RHODESIA GOVERNMENT

Electricity Supply Commission

THE Southern Rhodesia Electricity Supply Commission is prepared to make permanent appointments on its staff of Electrical Engineers and Electrical Artisans and Craftsmen, to fill the vacancies detailed below.

No application will be considered unless the candidate possesses the following qualifications: (a) For professional posts it is necessary to have the recognised university or professional training, and persons without will not be considered; (b) For artisan or craftsman posts candidates should be able to produce their indentures, and should be accepted members of their trade; (c) Applicants must not be over 45 years of age.

Posts available:—

Three District Engineers (£760 × £30 to £850). Technical qualifications should be A.M.I.E.E. standard, and preference will be given to those who have held a similar position with a Supply Authority.

One Senior Technical Assistant (£730 × £30 to £850). Candidates should be Corporate Members of an Institution of Electrical Engineers, and in addition hold an engineering degree.

Two Technical Assistants, Grade II (£525 × £25 to £600). Candidates should possess, as a minimum qualification, an Engineering Degree, and in addition must have had previous power engineering experience.

Cable Jointer (£480 × £30 to £600). Fully experienced in E.H.T., H.T. and L.T. work, and must travel. Electrical workshop experience an advantage.

Test Electrician (£480 × £30 to £600). Specialist knowledge of distribution and power transformers, switchgear, etc.

Meter Tester (£450 × £30 to £570). Single-phase; three-phase, three-wire; three-phase, four-wire; kWH, kW and kVA maximum demand meters, etc.

Meter and Instrument Mechanic (£450 × £30 to £570). All types meters and instruments, electrical and mechanical. Knowledge calibration.

Twelve Electricians (£450 × £30 to £570). Fully qualified electricians with experience with a Supply Authority.

Seven Linesmen (£420 × £30 to £540). For E.H.T., H.T. transmission, distribution, construction and maintenance work.

Draughtsman (£525 × £25 to £600). Knowledge design of electrical and mechanical apparatus, installations and preparation of building plans.

Forms of application may be obtained from E.S.C., Rhodesia House, 429, Strand, London, W.C.2. 170

BOROUGH OF WILLESDEN ELECTRICITY DEPT.

Cable Ganger

APPLICATIONS are invited for the above position from men who have been responsible for the supervision of labour and engaged upon laying all types of underground cable in urban areas. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, after a period of six months, and the selected applicant will be required to pass a medical examination.

The conditions of service, working conditions and rate of pay will be in accordance with District Council (No. 10) London Area, Electricity Supply Industry, present rate 2s. 3.960d. per hour = £5 9s. 6d. per week.

Applications, with copies of testimonials, should be sent to the undersigned not later than Monday, 15th April, 1946, endorsed "Cable Ganger."

W. T. PIRIE,
Town Clerk.

Town Hall,
Dyne Road, Kilburn, N.W.6. 212

COUNTY BOROUGH OF ROTHERHAM EDUCATION COMMITTEE

College of Technology

Principal: F. C. Clarke, B.Sc., A.R.C.Sc., A.M.I.E.E.

APPLICATIONS are invited for the post of Assistant Lecturer in ELECTRICAL TECHNOLOGY AND MAINTENANCE. Candidates should possess a degree or equivalent qualification in Electrical Engineering and should have had practical experience in the maintenance of electrical equipment.

Salary in accordance with the Burnham Report, 1945. Duties to commence as soon as possible.

Further particulars and application forms, which should be returned immediately, may be had from the undersigned.

J. A. MAIR,
Director of Education.

Education Offices,
Rotherham. 222

METROPOLITAN BOROUGH OF SAINT PANCRAS ELECTRICITY AND PUBLIC LIGHTING DEPT.

APPLICATIONS are invited for the following appointments:

(1) DEPUTY CONSUMERS' ENGINEER and METER SUPERINTENDENT. Candidates should possess experience in the organisation of a Meter Department, installation and maintenance of domestic apparatus and some experience in change-over from Direct to Alternating Current. Salary in accordance with the National Joint Board Schedule, Grade 6, Class G (present salary £511 7s., rising to £531 6s. per annum).

(2) MAINS ASSISTANTS (TWO). Candidates should possess considerable experience in the laying and maintenance of H.T. and L.T. mains and be capable of preparing schemes for new mains extensions and the design and equipment of substations. Salary in accordance with the National Joint Board Schedule, Grade 7, Class G (present salary £467 5s.. rising to £495 12s. per annum).

(3) GENERAL MAINS FOREMAN. Candidates must have had considerable experience of the supervision of H.T. and L.T. cable-laying and of the maintenance works connected therewith. The rate of pay will be an inclusive salary of £6 15s. per week (47 hours) subject only to any future variations (rise or fall) of the cost-of-living bonus, District Council (No. 10) Electricity Supply Industry.

All appointments will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful applicants will be required to pass a medical examination.

In regard to positions (1) and (2) Corporate Membership of the Institution of Electrical Engineers and/or the possession of an Engineering degree would be an advantage. Applications in writing, stating age, qualifications, and full details of education, training and experience, accompanied by copies of three recent testimonials, must be delivered to the undersigned not later than the 17th April, 1946.

R. C. E. AUSTIN, LL.M.,
Town Clerk.

St. Pancras Town Hall,
Euston Road, London, N.W.1.
25th March, 1946. 211

BOROUGH OF LEIGH ELECTRICITY DEPT.

Appointment of Draughtsman

APPLICATIONS are invited for the position of Draughtsman in the above Department. The salary will be at the rate of £275 per annum, plus bonus (at present £59 16s. per annum).

Applicants must be capable of designing substations and buildings, and have a sound knowledge of modern drawing office practice and general mains records. The appointment, which will be subject to the provisions of the Local Government Superannuation Act, 1937, and to the selected candidate passing satisfactorily a medical examination to be conducted by the Council's Medical Officer of Health, will be determinable by one month's notice on either side.

Applications, endorsed "Draughtsman," stating age, and containing particulars of education, qualifications and experience, accompanied by copies of not more than three recent testimonials, must be delivered to the Borough Electrical Engineer, Electricity Offices, Bradshawgate, Leigh, Lancs., not later than 2nd April, 1946.

ALBERT JONES, Town Clerk.

Town Hall, Leigh. 103

CORPORATION OF NELSON ELECTRICITY DEPT.

Mechanical Fitter

APPLICATIONS are invited for the above appointment. Applicants must have had a sound training in and experience of the erection and maintenance of steam turbines (preferably Brush-Ljungstrom, but not essential) medium pressure water tube boilers, chain grate stokers and all power station auxiliary plant.

Conditions of service and pay in accordance with the D.J.I.C. Schedule No. 3 Area, Zone B, at present, minimum 26.63d. per hour for a 47-hour week.

The successful candidate will be required to pass a Medical Examination and contribute to the Corporation's Superannuation Scheme. Applications, stating age, experience and present appointment, and accompanied by copies of not more than three testimonials, should be sent to the undersigned not later than 5th April, 1946.

T.D. MARTIN, A.M.I.E.E.,
Borough Electrical Engineer and Manager.

Electricity Works,
Nelson.
19th March, 1946. 241

BOROUGH OF ABERYSTWYTH

Appointment of Electrical Engineer and Manager

APPLICATIONS are invited for the appointment of Engineer and Manager of the Council's Electricity Undertaking from Engineers who are experienced in Electricity Supply and in the management and administration of an Electrical Undertaking.

The salary will be in accordance with the scale set out in the agreement made by the National Joint Committee of Local Authorities and Chief Electrical Engineers dated 9th July, 1941. In accordance with Clause 10 of such agreement, the salary for the first year will be 85% of the full salary, and for the second year 92½% thereof, the full salary being paid in the third and subsequent years. The units sold for the year ending 31st March, 1945, were 3,121,624, of which 540,820 were sold in bulk.

Applicants should be Corporate Members of the Institution of Electrical Engineers. The appointment will be terminated by three months' notice on either side and will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination. No form of application will be issued, but full particulars of the duties, terms and conditions of employment may be obtained from the undersigned.

Applications, stating age, qualifications and experience, with particulars of present and past appointments, together with the names and addresses of three persons to whom reference can be made, must be delivered to the undersigned in envelopes endorsed "Electrical Enginer," on or before 11th May, 1946.

H. D. P. BOTT,
Town Clerk.

Town Hall, Aberystwyth.
23rd March, 1946. 223

CITY OF MANCHESTER ELECTRICITY DEPT.

APPLICATIONS are invited for the appointment of an ELECTRICAL MAINTENANCE ENGINEER, to supervise the maintenance of all electrical plant and equipment in a Class K electrical power station, including the supervision of new work; and to be thoroughly conversant with Factory Regulations and other codes of good practice.

Applicants must have served a workshop apprenticeship, and be Corporate Members of the Institution of Electrical Engineers. Age not more than 45. Salary in accordance with Class K, Grade 7, of the N.J.B. Schedule, £546 p.a. to commence.

The appointment will be subject to the City Council Superannuation Scheme, and the successful candidate will be required to pass a medical examination. Applications, giving full particulars of age, technical training and experience, together with copies of recent testimonials, must be endorsed "Electrical Maintenance Engineer," and addressed to the Chairman of the Electricity Committee, Town Hall, Manchester, 2, not later than 10 a.m. on Tuesday, 23rd April, 1946. Canvassing, directly or indirectly, will disqualify.

PHILIP B. DINGLE,
Town Clerk.

Town Hall,
Manchester, 2.
March, 1946. 216

ELECTRICITY SUPPLY BOARD, EIRE

Vacancies for Electrical Engineers

THE Electricity Supply Board invites applications for two positions on its engineering staff:

(a) Technical Divisional Engineer, Rural Electrification.

(b) Development Divisional Engineer, Rural Electrification.

Candidates must have a University Degree in Electrical Engineering or its equivalent. For (a) experience in the design and construction of high tension and low tension overhead networks, and for (b) experience in the development of electricity sales generally or particularly in the application of electricity to agriculture is desirable.

Each position carries a salary scale, £600 × £20 to £800 per annum and in addition, the prevailing emergency bonus.

The appointments will be on probation for a period of six months and the starting salaries in the scale will depend on the qualifications and experience of the successful candidates. Candidates appointed will be required to pass a medical examination. Applications stating age, qualifications and experience should reach the undersigned not later than the 6th April, 1946.

PATRICK J. DEMPSEY,
Secretary.

Electricity Supply Board,
60-62, Upper Mount St., Dublin. 4999

NAVAL SERVICE OF CANADA

A limited number of suitably qualified civilian Electrical Engineers is required immediately by the Royal Canadian Navy for service in the Dominion of Canada. The appointments will be for two years duration, with the possibility of extension. Travelling expenses from the United Kingdom to place of employment in Canada, and, in the event of termination of appointment, return to the United Kingdom will be provided for successful candidates, and their wives and children, at first-class rates. Reasonable costs of moving household effects to place of residence in Canada, and return to the United Kingdom, will be provided. Salaries will be dependent upon qualifications.

Applicants should hold the Higher National Certificate or a University Degree in Electrical Engineering, and should have had good practical training and experience in industry. In addition, war-time experience in the detailed layout, installation and testing of electrical systems in modern cruisers, aircraft carriers and destroyers is essential. Applications, giving full details of age, nationality, general and technical education, industrial and war-time experience, are to reach the Canadian Naval Mission Overseas, 10, Haymarket, London, S.W.1, not later than Monday, 8th April, 1946. Copies of not more than three recent testimonials are to be forwarded with applications. 128

BEDWAS & MACHEN URBAN DISTRICT COUNCIL

Meter Tester and Repairer

APPLICATIONS are invited for the permanent position of Meter Tester and Repairer in their Testing Station approved under the Electricity Supply (Meters) Act, 1936. Applicants must have had experience and technical training in repairing and testing all types of A.C. Quarterly and Prepayment Meters, Time Switches and Indicating Instruments. Salary in accordance with the National Joint Board Schedule, Class B, Grade 8a.

The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful applicant will be required to undergo a medical examination. Applications, stating age, details of experience and qualifications, and accompanied by copies of two recent testimonials, must be received by the undersigned not later than first post on Tuesday the 2nd day of April, 1946. Envelopes to be marked "Meter Tester" in top left-hand corner.

By order of the Council,
W. EWART MORGAN,
Clerk.

Council Offices, Bedwas, Mon.
12th March, 1946. 122

BOROUGH OF MANSFIELD ELECTRICITY DEPT.

APPLICATIONS are invited for the position of Plumber Cable Jointer. Applicants must have had experience in extra high tension and low tension jointing to feeder pillars, network boxes and substation E.H.T. and L.T. switchboards. Conditions of service and rates of pay will be generally in accordance with the D.J.I.C. Schedule (No. 7 Area), at present 2s. 4½d. per hour.

The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination. Applications, stating age, previous experience, present appointment, and accompanied by recent testimonials, to be addressed to the undersigned not later than April 18th, 1946.

A. LATHAM, M.I.E.E.,
Engineer and Manager.

Lime Tree Place, Mansfield.
23rd March, 1946. 214

CITY OF SALFORD ELECTRICITY DEPARTMENT

APPLICATIONS are invited for the post of Senior Assistant Electrical Engineer at a salary in accordance with Grade 7, Class H, of the N.J.B. Schedule. The present value is £485 per annum rising to £501 per annum in 4 years.

The appointment will be subject to the provisions of the Local Government Superannuation Act, and the selected candidate will be required to pass a medical examination. Candidates should have had technical training up to H.N.C. standard, and experience in the manufacture, installation, operation and maintenance of power station and substation switchgear, transformers and protective system. All applications should be addressed to the City Electrical Engineer, Electricity Department, Frederick Road, Salford, 6, Lancs., and must be received by Monday, 8th April.

H. H. TOMSON, Town Clerk. 235

FINCHLEY CORPORATION ELECTRICITY DEPT.

Appointment of Assistant Consumers' Engineer

APPLICATIONS are invited for the position of Assistant Consumers' Engineer in the Electricity Department, at a salary in accordance with the National Joint Board Scale, Class G, Grade 8, at present £441 per annum.

Candidates must have had sound theoretical and practical electrical training and possess a knowledge of tariffs, preparation of wiring specifications, design of electrical installations and the general duties associated with the post of Assistant Consumers' Engineer. Preference will be given to Corporate Members of the Institution of Electrical Engineers. The appointment is subject to the provisions of the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination by the Council's Medical Officer of Health. Applications should be sent to the undersigned, accompanied by copies of not more than three recent testimonials, by not later than 30th April, 1946, and endorsed "Assistant Consumers' Engineer". Formal application forms will not be issued. Canvassing any member or any officer of the Town Council either directly or indirectly will be deemed a disqualification.

C. R. WESTLAKE, M.I.E.E.,
General Manager and Engineer.

Electricity Department,
Squire Lane,
Finchley, N.3.
22nd March, 1946. 226

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

THE Board invite applications for the following appointments to the permanent staff:—

(1) Qualified Senior Accountant (age over 30), at commencing salary of £750 per annum.
(2) Qualified Legal Assistant (age over 25), at salary of £400-£600 p.a. according to age and experience.
(3) Commercial Assistant (age over 25), with experience in an Electricity Undertaking, at salary of £400-£500 per annum according to age and experience.
(4) Qualified Assistant Accountants (age over 22), at commencing salary of £300 per annum.
(5) Clerical Assistants (age over 25), with experience in electricity accounting work, at commencing salary of £250 per annum.
(6) Experienced Shorthand Typists (age 20 and over), at salary of £3 6s. per week, rising to £4 4s. per week, with placing according to age and experience.

Successful applicants will require to pass a medical examination and become contributors to the Superannuation Fund for the Board's staff. Official form of application can be obtained from the undersigned by sending stamped addressed foolscap envelope.

(Sgd.) T. LAWRIE,
Secretary.

16, Rothesay Terrace,
Edinburgh, 3.
21st March, 1946. 203

GAINSBOROUGH U.D.C. ELECTRICITY DEPT.

APPLICATIONS are invited for the appointment of a Fitter-Driver at the Council's Electricity Generating Station. Preference will be given to persons having a knowledge of Marshall's Semi-Diesel Oil Engines, Electricity Generation and Water Pumping Equipment.

Wages and conditions of service will be in accordance with the District Joint Industrial Council's Scale for the Electricity Supply Industry, at present 2s. 4d. per hour. Applications, stating age, experience, references, etc., to be delivered to the undersigned not later than Monday, the 15th April, 1946.

REG. C. HAMMERSLEY, A.M.I.E.E.,
Engineer and Manager.

Council Offices,
Gainsborough.
20th March, 1946. 179

LEEDS COLLEGE OF TECHNOLOGY

(Principal: C. Chew, M.Sc.Tech., F.R.I.C.)

Department of Electrical Engineering and Physics

APPLICATIONS are invited for the post of Full-time Lecturer in Electrical Engineering, duties to commence in September next. Applicants should be suitably qualified and have had industrial and teaching experience. Salary according to Burnham Scale, with an allowance for a post of responsibility.

Particulars and form of application, to be returned not later than Saturday, 13th April, may be obtained by sending a stamped addressed foolscap envelope to the Director of Education, Education Dept., Leeds, 1. 131

BOROUGH OF DOUGLAS ELECTRICITY DEPT.

Chief Assistant Engineer

APPLICATIONS are invited for the position of Chief Assistant Engineer from Chartered Engineers who have had experience with an Electricity Supply Undertaking in generation by means of water tube boilers and turbo-alternators, and in distribution, including automatic rectifier substations, and the change over of supply networks from D.C. to A.C. Applicants must not be over 45 years of age.

The salary will be in accordance with N.J.B. Schedule, at present Class E, Grade 2 (less 7½%), commencing at £574 per annum.

The appointment will be an established post under the Superannuation Scheme of the Corporation, and the successful applicant will be required to pass a medical examination and to contribute to the Council's Superannuation Fund. The Council's Superannuation Scheme does not provide for receipt or payment of any transfer value on entering or leaving the Council's service. A suitable interval will be allowed in order to permit applications to be received from those serving in His Majesty's Forces.

Applications, endorsed "Chief Assistant Engineer," giving particulars of age, qualifications and experience, together with copies of not more than three recent testimonials, should be addressed to the Borough Electrical Engineer and Manager, Electricity Offices, Douglas, not later than April 20th, 1946.

PERCY M. SHIMMIN,
Town Clerk.

Town Hall,
Douglas, Isle of Man.
12th March, 1946. 108

THE URBAN DISTRICT COUNCIL OF ABERDARE ELECTRICITY AND TRANSPORT DEPT.

Appointment of Junior Mains Assistant

APPLICATIONS are invited for the position of Junior Mains Assistant at a salary in accordance with the N.J.B. Schedule, Class D, Grade 8a, commencing at the present rate of £329 per annum to £341 per annum. Applicants should have a sound technical training and experience in the construction, maintenance and operation of overhead and underground transmission and distribution systems and in the layout and estimating for this class of work.

Applicants should possess an Engineering Degree and/or be a Graduate of the Institution of Electrical Engineers. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937. The selected candidate will be required to pass a medical examination. Applications, accompanied by not more than three testimonials and endorsed "Junior Mains Assistant," to the addressed to and reach the Clerk to the Council, Town Hall, Aberdare, Glam., not later than noon, Thursday, the 18th April, 1946.

W. E. RICHARDSON,
M.I.E.E., A.M.Inst.T.,
General Manager.

Electricity and Transport Dept.,
Gadlys, Aberdare, Glam.
18th March, 1946. 168

THE URBAN DISTRICT COUNCIL OF ABERDARE ELECTRICITY AND TRANSPORT DEPT.

Appointment of Meter Engineer

APPLICATIONS are invited for the position of Meter Engineer at a salary in accordance with the N.J.B. Schedule, Class D, Grade 8, at present £356 per annum to £366 per annum. The Meter Testing Station is Class A Polyphase. Applicants must have practical and technical training in testing, calibrating and repair of all types of A.C. meters, indicators and instruments, and sub-standard apparatus.

Applicants should have passed the Graduate Examination of the Institute of Electrical Engineers, or hold an equivalent qualification. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937. The selected candidate will be required to pass a medical examination. Applications, accompanied by not more than three testimonials and endorsed "Meter Engineer," to be addressed to and reach the Clerk to the Council, Town Hall, Aberdare, Glam., not later than noon, Thursday, the 18th April, 1946.

W. E. RICHARDSON,
M.I.E.E., A.M.Inst.T.,
General Manager.

Electricity and Transport Dept.,
Gadlys, Aberdare, Glam.
18th March, 1946. 167

BOROUGH OF BACUP ELECTRICITY DEPT.

APPLICATIONS are invited from Graduate or Corporate Members of the Institution of Electrical Engineers, or Engineers holding equivalent qualifications, for the positions of :—

(a) CONSUMERS' ENGINEER, at a salary in accordance with Class D, Grade 7, of the N.J.B. Schedule (now £377 per annum).

(b) SECOND MAINS ASSISTANT, at a salary in accordance with Class D, Grade 8a (now £329 p.a.).

Candidates for (a) should be experienced in the management of showrooms and the technical side of a Consumers' Department, including industrial and domestic appliance repairs. Candidates for (b) must be experienced in the general operation of high-and medium voltage A.C. underground systems and transformer substations.

Applications, endorsed "Consumers' Engineer" or "Mains Assistant," as the case may be, stating age and giving details of training and experience, together with copies of three recent testimonials, should be delivered to the undersigned not later than Monday, 15th April, 1946.

L. STOTT,
Town Clerk.

Municipal Offices, Bacup.
21st March, 1946. 229

BOROUGH OF RADCLIFFE ELECTRICITY DEPT.

Cable Jointer (Plumber)

APPLICATIONS are invited for the position of Cable Jointer in the above Department. Wages and working conditions in accordance with the Schedule of the District Council, No. 3, North-Western Area, Electricity Supply Industry, Zone A. Present rate 27.45d. per hour for a 47-hour week.

Applicants must have experience in high and low tension mains jointing, feeder pillar, network boxes and substation H.T. and L.T. boards. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and to a satisfactory medical examination. Applications, stating age and experience, and accompanied by copies of not more than three recent testimonials, endorsed "Jointer," should reach the undersigned not later than Wednesday, April 3rd, 1946.

H. A. FOX,
Town Clerk.

Town Hall,
Radcliffe, Manchester.
March, 1946. 4993

METROPOLITAN BOROUGH OF FULHAM ELECTRICITY DEPARTMENT

APPLICATIONS are invited for the position of Junior Technical Engineer at the Council's Base Load Generating Station, Townmead Road, Fulham, in Class L, Grade 10, of the National Joint Board Schedule, with a commencing salary of £382 4s. per annum. Applicants must be under 35 years of age, have had technical education up to Inter. B.Sc. standard and have had experience in the operation of steam-raising plant and generating equipment.

Form of application and general conditions of the appointment may be obtained by sending a stamped addressed foolscap envelope to the undersigned, to whom completed applications must be returned within fourteen days of the date on which this advertisement appears.

CYRIL F. THATCHER.
Town Clerk.

Town Hall, Fulham, S.W.6.
March, 1946. 163

A Scientific Glass-Blower required for our lamp factory in Scotland. Good prospects for a good man. Applications, stating salary expected, age, experience, etc., to be sent to—The Manager, British Luma Co-op. Elec. Lamp Soc. Ltd., Shieldhall, Glasgow, S.W.1. 146

A Senior and a Junior Transformer Draughtsman required by manufacturers of all types of air and oil-cooled transformers up to 1,000 kVA. Permanent progressive position. Apply—London Transformer Products Ltd., Cobbold Estate, Cobbold Rd., Willesden, N.W.10. 166

APPLICATIONS are invited for the position of Assistant Sales Engineer at the Doncaster Office of the Yorkshire Electric Power Co. Candidates should have had wide experience on the commercial side of an electricity undertaking, particularly in negotiating industrial power supplies. Possession of recognised professional qualifications is desirable. Apply, stating full particulars of training, experience and salary required, to—GM/GH(3), The Yorkshire Electric Power Co., Bramhope, nr. Leeds. 159

ARMATURE Winder for small and medium work required by Croydon firm. Trade union conditions.—Box 66, c/o The Electrical Review.

ARMATURE Winder required. Reply, stating details of experience and wages required.—Box 8699, c/o The Electrical Review.

ARMATURE Winders, A.C.-D.C., FHP-10 h.p., good rates, permanency male and female.—Magstarlite Ltd., Beavor Lane Hammersmith. 8682

APPLICATIONS are invited for the position of Electrical Engineer as Assistant to the Chief Engineer, at a group of collieries in North-East England. Candidates must have a sound practical and technical training in engineering practice and qualifications at least to A.M.I.E.E. or H.N.C. standard. Experience in technical planning, recording and organization of H.T. and medium pressure systems is essential. Manufacturing experience of mining electrical apparatus would be an advantage. The successful candidate would be provided with a free house and coal, will be required to pass a medical examination, and to join the Company's Contributory Pension Scheme. Salary £600/700. Applications, stating age, education, training and recent appointments, should be made, not later than 12th April, 1946, to—Box 180, c/o The Electrical Review.

ASSISTANT Electrical Engineers, one Senior, one Junior, required by leading Ceylon engineering company. Applicants must have general experience of lighting and power installations, armature winding, transmission workshop routine, stationary batteries, designing, estimating, supervising and handling of labour. The agreement would be one of 4 years, with possible permanency. Write fully, with copies of testimonials, etc.—Box ZC.495, Deacons Advertising, 36, Leadenhall Street, London, E.C.3. 4976

ASSISTANT Electrical Engineer, age about 25, required by Manchester manufacturers, for preparation of specifications, schemes and connection diagrams for electrical storage battery installations. Experience with static rectifiers and control gear essential. Salary according to qualifications and experience. Applications, giving details of training, etc., to—Box 4928, c/o The Electrical Review.

ASSISTANT Experimental Electrical Engineer, with good theoretical background, is required for working in laboratory. Experienced in light precision electrical engineering with sound mechanical knowledge, capable of designing and testing equipment. Knowledge of optics and photographic apparatus would be useful but not essential. Permanency with option of contributory pension scheme. Salary £400/500 p.a., according to qualifications. Apply in writing, giving full particulars and stating age, training and experience to—Muirhead & Co. Ltd., Elmers End, Beckenham, Kent. 119

ASSISTANT required by Sales Manager of Company manufacturing electrical indicating instruments, London area. Must be thoroughly conversant with indoor commercial routine and export procedure. Able to work on own initiative and control staff. Technical training and experience of instrument trade essential. Reply, stating age, experience and salary required. Our staff are aware of this vacancy.—Box 4902, c/o The Electrical Review.

BECTIVE Electrical Co. Ltd. require Electricians for work in London and the Home Counties, etc. Apply—36, Davies St., London, W.1. Phone, May. 7133-4-5. 140

BUYER (Senior), required by large company of manufacturing electrical engineers. Experience in modern purchasing methods, relating especially to ferrous and non-ferrous metals, manufactured parts and manufacturing plant, small tools and consumable stores, essential. Permanent, progressive, pensionable appointment. Write, stating age, training and experience to—Box 110, c/o The Electrical Review.

CHIEF Assistance for house service electrical meters sales dept., required by leading Electrical Company (London). Good technical and sales knowledge of meters essential and preference will be given to applicants also having knowledge of low tension switch and fusegear.—Box 239, c/o The Electrical Review.

CONSULTING Engineers in the Kingston, Surrey area require a Junior Engineering Assistant for calculation work and general assistance in the preparation of reports. Some knowledge of power supply systems and some drawing office experience would be an advantage. Salary in the region of £400/£500 per annum according to qualifications. Applications in writing, stating age and experience to—Messrs. Merz & McLellan, Milburn, Esher, Surrey. 210

CONTROL Development Engineer. Manufacturer in South of England establishing new department invites applications from Senior Engineers to take charge of development of new range of D.C. control gear. Applicants should preferably have had administrative experience, be graduates in electrical engineering, and with design development and/or research experience. Salary £850 to £1,000 a year. Superannuation Fund. Reply to—Box 144, c/o The Electrical Review.

DESIGNER required for special types of D.C. and A.C. electrodynamic machines up to about 20 kW. Previous experience and engineering degree essential.—Box 4860, c/o The Electrical Review.

DESIGNER-Draughtsmen required by M.K. Electric Ltd. Applications are invited from first-class experienced men who have specialised in the design of electrical accessories, plugs and sockets, switches, switch-sockets, etc. All applications, in strict confidence, to—The General Works Manager, M.K. Electric Ltd., Wakefield Street, Edmonton, London, N.18. 4878

DEVELOPMENT Draughtsman or Designer-Draughtsman, senior, required by old-established firm in London area, for new development in light engineering, electrical and mechanical, mainly dynamo-electric machinery and automatic switchgear. Works apprenticeship and previous experience essential.—Box 207, c/o The Electrical Review.

DISPATCH Clerk and trade counter assistant required by wholesalers. Must be fully conversant with electrical material.—London Electrical Company, 92, Blackfriars Road, S.E.1. 24

DOMESTIC Appliances: Senior Draughtsman required to take charge of drawing office. Wide experience of mass production methods, light press tool work and component design essential. Good salary will be paid to able and ambitious man. Staff notified. Applications with full particulars to—Box 148, c/o The Electrical Review.

DRAUGHTSMAN, experienced in design of electric lift control gear. Permanent position. Higher National standard. Salary up to £425 per annum.—Box 178, c/o The Electrical Review.

DRAUGHTSMAN required for maintenance and development work, steel rolling mill plant. State age, qualifications, experience and salary. Replies in writing to—Box 208, c/o The Electrical Review.

DRAUGHTSMAN/Designer required by small electrical apparatus and plastic moulding manufacturers. Interesting work. Please state salary required and full particulars of past experience. London area.—Box 4946, c/o The Electrical Review.

DRAUGHTSMAN-Designer required, with good all-round experience of machines for incandescent lamps and also of machines for fluorescent tubular lamps. The fluorescent dept. will have to be developed entirely from the beginning. Applicants with sound technical knowledge and experience are asked to apply, stating salary expected, age, experience, etc., to—The Manager, British Luma Co-op. Elec. Lamp Soc. Ltd., Shieldhall, Glasgow, S.W.1. 133

DRAUGHTSMEN required, experienced in mechanical design and electrically operated machines, both A.C. and D.C. Good prospects for men capable of taking responsibility.—Box 255, 8 Serle St., London, W.C.2. 158

DRAUGHTSMEN required by switchgear engineers. Experienced in contract work, protective gear diagrams or design. Applications in writing, with full particulars, to—Ferguson, Pailin Ltd., Manchester, 11. 86

ELECTRICAL Contractors require Electrical Wiremen and Assistants for London, Home Counties, North-West, South-West, South of England and Scotland. Apply—Troughton & Young Ltd., Imperial Court, Basil Street, London, S.W.3. 84

ELECTRICAL and Mechanical Engineers required for immediate service in the Far East. Must have a degree or membership of some recognised Institution. Knowledge of the operation of electricity supply undertakings, which must include Diesel engines, alternators, generators, switchgear, motors, transformers, transmission and distribution systems, is essential; must also have knowledge of electricity supply accounts. Reply, giving full details qualifications and experience, also salary required, to—Box 206, c/o The Electrical Review.

ELECTRICAL Draughtsman used to industrial light and power layouts, A.C. and D.C. Apply to—Staff Manager, Kodak Limited, Wealdstone, Middx. 137

ELECTRICAL Engineer required as Assistant Works Manager in factory manufacturing transformers and electrical equipment in Manchester area. Age preferably 25-35, with good technical background essential. Must have had experience in control of mixed labour and transformer manufacture up to 30 kVA. Commencing salary £520.—Box 135, c/o The Electrical Review.

ELECTRICAL Engineer with first-class knowledge of latest developments in design and manufacture of electric motors up to 100 h.p. Write, giving details of career, positions held and salary required, to—Box 190, c/o The Electrical Review.

ELECTRICAL Manufacturing Company's Patent Dept. in London area requires Assistants for general patent work. Applicants should present a good Honours Degree in General Science, Physics or Engineering. A knowledge of patent work would be an advantage, but is not essential. Applications should be addressed to—Box 181, c/o The Electrical Review.

ELECTRICAL engineers and contractors require Estimate Draughtsman with sound knowledge of design and estimating of industrial power and lighting installations. Write, giving full particulars, age, and salary required.—W. H. Tew & Co., Crocus St., Nottingham. 149

ELECTRICAL Fitter required for service work at industrial works and power stations in London area. Electrical knowledge and ability to work without supervision essential. State age, experience and wages required.—Box 8711, c/o The Electrical Review.

ELECTRICAL Wiremen and Assistants required for London, Cardiff, Devon and Cornwall. Apply—Labour Superintendent, Drake & Gorham Ltd., 36, Grosvenor Gardens, S.W.1. 189

ELECTRICIAN required for wiring control panels, electrical instruments, etc. Must have ability to wire from circuit diagram and be accustomed to high quality work. N.W. London area.—Box 199, c/o The Electrical Review.

ELECTRICIAN-Wiremen for general electrical work on large contracts; permanencies to suitable applicants. —J. W. Russell Ltd., Electrical Contractors, 18, Queens Road, Watford. 37

ELECTRICIANS, 1st-class Lond. work only, highest rate. —Henfrey Electrical, 42, Gt. Titchfield St., W.1. 4751

ELECTRICIANS required for all types of installation work. Please apply to—J. H. Plant Ltd., 99, St. Martin's Lane, Charing Cross, W.C.2. 34

ELECTRICIANS required for general installation work in the London area. Write full particulars to—F. H. Wheeler & Co. Ltd., 39, Victoria Street, S.W.1. 4898

ELECTRICIANS wanted for London area. Permanent jobs for first-class men. Apply—S. Rogers & Co., 7, Bloomsbury Street, W.C.1. 205

ELECTRICIANS wanted. Permanent employment to suitable applicants. Comfortable working conditions, top rates of pay and liberal allowances.—C. A. Newton & Co. Ltd., St. James's St., Derby (Derby 46015-16). 4975

ENGINEER required to take charge of laboratory developing radio test equipment and electrical measuring instruments. Good technical qualifications and experience essential. Apply by letter, giving full particulars of experience and salary required to—Taylor Electrical Instruments Ltd. 419-424, Montrose Avenue, Slough, Bucks. 8726

ENGINEERING firm in the South Manchester area requires immediately the services of a Technical Estimator. Some experience in pump and electrical work preferable, more particularly the latter. Firm willing to train keen young man. Full details in first instance to—Box 205, c/o The Electrical Review.

ENGINEERS and Draughtsmen are invited to apply for technical positions in the switchgear and heavy electrical plant departments (covering switchgear, electrical machines and transformers of all kinds) of a large electrical engineering manufacturer in the Midlands. Applications stating age, appropriate technical qualifications and industrial experience, and order of salary required, to—Box 69, c/o The Electrical Review.

EXPERIENCED Draughtsman for mechanical design work required for engineering dept. of manufacturers in Enfield district. Write full particulars to—Box K.2196, A.K. Advg., 212a, Shaftesbury Ave., W.C.2. 136

EXPERIENCED Electric Motor Fitters required for repair shop, capable of finding faults and doing mechanical repairs, permanent job suitable men. Write stating age, experience and wages required to—W. H. Sueden & Co. Ltd., Glenny Road, Barking, Essex. 143

FOREMAN Armature Winder required. Used to all classes of work, control of labour and organising of dept. Good salary to suitable applicant.—Box 8703, c/o The Electrical Review.

FOREMAN Electrician required in South-West area for large contracting firm. Permanent situation for suitable man. Write, giving full details, to—Wheeler, 6, Queen Square, Bristol, 1. 8642

FOREMAN of Moving Coil/Iron Instrument Assembly. Capable man, experienced in supervising production of these products, is offered good salary, output bonus and prospects. Please write fully.—Box 4843, c/o The Electrical Review.

FOREMAN required by firm of electrical manufacturing engineers, West London area. Applicants must have thorough all-round workshop experience (not mass production) and be capable of instructing. Write, stating age, training, full details of experience, and salary required.—Box 230, c/o The Electrical Review.

GENERAL Foreman required by firm of electrical contractors in London area. Applicant must have had previous experience in supervising contracts, labour, etc., with knowledge of costing. Position offered will be permanent to suitable applicant. Write giving full details of previous experience, age, and salary required. All replies strictly confidential.—Box 171, c/o The Electrical Review.

INSTRUMENT Maker for model shop work required by manufacturers of small and medium-sized transformers and electrical instruments, N.W. London area.—Box 200, c/o The Electrical Review.

JIG and Tool Draughtsman required for light mechanical and electrical engineers, London area.—Box 151, c/o The Electrical Review.

JUNIOR Draughtsman required by telephone manufacturers. Apply to—Autophone Ltd., 73, Great Peter Street, S.W.1. Telephone, Abbey 5588. 8687

JUNIOR Draughtsman required for detailing and scheduling work by transformer manufacturers, N.W. London. Progressive position with good prospects for keen applicant.—Box 201, c/o The Electrical Review.

JUNIOR Draughtsmen, Estimators and Cost Clerks required by electrical contractors. Apply—Troughton & Young Ltd., Imperial Ct., Basil St., London, S.W.3. 85

LABOUR Supervisor required by London electrical contractors; must be capable of handling men engaged on all types of installations and be fully conversant with E.T.U. conditions and M.O.L. & N.S. procedure. Apply, stating previous experience, etc.—Box 139, c/o The Electrical Review.

MODEL Makers required. Capable men, experienced at bench and also on lathe, millers, etc. Previous experience essential. Model making small and intricate mechanisms. Top rates. Manufacturing electrical engineers, situated in North London. Apply—Box 4877, c/o The Electrical Review.

ORGANISATION (not Manufacturers) in London require engineer having experience in preparing and examining tenders and contracts for steam turbo-generator plant. Age not above 40. Apply, stating full experience, present employment, and salary expected. All applications will be treated in strictest confidence.—Box 8629, c/o The Electrical Review.

REQUIRED by firm of scientific instrument makers in West London area, Senior Draughtsmen for design work on marine and aircraft equipment. Must have good electrical knowledge and sound engineering training. Junior Draughtsmen for detailed work and wiring layouts. Also Senior Jig and Tool Draughtsmen. Reply, stating age, training, full details and experience, and salary reqd., to—Box 2326, c/o White's Ltd., 72 Fleet St., E.C.4. 4848

REQUIRED for Birmingham area, first-class Electrical Designer. Must have sound knowledge of electronics and be capable of designing small time cycle mechanisms and magnetic valves for commercial mass production. Good salary and prospects for the right man. Write—Box 169, c/o The Electrical Review.

SALESMAN required for high-class Electric Fittings Showrooms with West End experience. Apply—Secretary, Maple & Company Limited, Tottenham Court Road, W.1. 4900

SALESWOMAN. Large electrical contractors in the N.W. London area require an experienced Saleswoman to fill responsible position in showrooms. Reply, stating age and giving full details of experience, to—Box 4953, c/o The Electrical Review.

SENIOR Draughtsman required by manufacturers of small and medium transformers and light electrical equipment, N.W. London area. Successful applicant must have some knowledge of transformers, and be well versed in manufacturing design and associated tool design. Full details of age, experience and salaries earned to—Box 202, c/o The Electrical Review.

SHOWROOM Manager required by firm of electrical contractors in London area. Applicants with previous experience considered only. Write giving full details of previous experience, age, and salary required.—Box 172, c/o The Electrical Review.

SWITCHGEAR Designer-Draughtsman, preferably with experience on on-load tap change gear for power transformers. Salary £6 10s. per week plus £1 8s. 6d. war bonus. Pension scheme. Overtime pro rata on salary and war bonus. S.W. London.—Box 184, c/o The Electrical Review.

TECHNICAL Engineer, with experience in the preparation of electrical traction control schemes, design of apparatus, and the handling of contracts. Good practical experience and technical education essential, but anyone having industrial D.C. experience would be considered. Sal. £500-£600 p.a.—Box 4853, c/o The Electrical Review.

THE Hongkong Electric Co. Ltd. require a Shift Engineer for their power station at Hongkong. Experience with turbo-alternators and water tube boilers essential. Commencing salary, Hongkong dollars 400 per mensem, with exchange compensation when dollar exchange rate is below 2s. House allowance. Provident fund. First agreement three years. Full particulars from—The London Representative, The Hongkong Electric Co. Ltd., c/o Messrs. Gray, Dawes & Co., 122, Leadenhall St., London, E.C.3. 150

THE South Staffordshire Mond Gas Co., of Dudley Port, Tipton, Staffordshire, invite applications for the post of Works Manager. Applicants should not be more than 45 years of age, and have had sound mechanical engineering training, including experience of the maintenance of gas producer plant, water tube boilers, steam engines, turbines, pumps and electrical plant. Must be accustomed to the control of men. Commencing salary £500, with scope for advancement. Please state age, qualifications and experience.—Box 134, c/o The Electrical Review.

TRANSFORMER Assembly Shop Foreman required for work up to 25 kVA. Previous experience in similar position transformer manufacturer essential, London area.—Box 4563, c/o The Electrical Review.

TRANSFORMER Designer required, fully experienced in all types of air and oil-cooled transformers up to 1,000 kVA. Permanent progressive position. Apply—London Transformer Products Ltd., Cobbold Estate, Cobbold Road, Willesden, N.W.10. 165

URGENTLY required, Electrical Testers with experience of testing all types of A.C. and D.C. machines, including heavy plant. Applicants should possess technical knowledge equivalent to Ordinary National Certificate. Apply—Superintendent, Personnel Department, British Thomson-Houston Co. Ltd., Rugby. 191

WORKS Manager. Large manufacturers of electrical machinery invite applications from men possessing first-class experience in this capacity, embracing production and administrative responsibility in an engineering concern. Permanent, pensionable and progressive appointment. Applicants, age 35 to 45, must have had full electrical and mechanical engineering training, preferably graduate standard, followed by practical experience in charge of production. Write, stating age, education and experience, to—Box 4945, c/o The Electrical Review.

X-Ray and Electro-Medical Engineer required for Scotland. State age, experience and salary required. Good prospects for the right man.—Box 307, McCallum & Co., 42, North Bridge, Edinburgh. 176

APPOINTMENTS FILLED

Dissatisfaction having been so often expressed that unsuccessful applicants are left in ignorance of the fact that the position applied for has been filled, may we suggest that Advertisers notify us to that effect when hey have arrived at a decision? We will then insert a notice free of charge under this heading.

A. S. Orr & Co. Ltd.—Electrical Engineer; Borough of Mansfield—Chief Assistant Engineer; County Borough of Rochdale—Distribution Engineer and Third Assistant Mains Engineer. All applicants are thanked.

SITUATIONS WANTED

A Buyer/Stock Controller/Accountant, age 33, desires progressive position where hard work and initiative is appreciated; 15 years' experience. Contacts with leading electrical suppliers, sound organizing ability.—Box 8685, c/o The Electrical Review.

A keen Representative in the London district, wishing to make a change, desires to represent a firm of electrical wholesalers dealing in E.L.M.A. lamps, C.M.A. and all lighting and power accessories, etc., etc., on a commission basis, no salary required. Connection amongst large group of cinemas, large stores (maintenance depts.), works and catering companies.—Box 8691, c/o The Electrical Review.

A Technical Engineer, age 27, 4½ years' experience in design, manufacture and test of automatic control gear and industrial switchgear, also contract work and estimating, good organiser and administrator, seeks position offering interest and scope in London. Keen on contactors and their use in control engineering, interested in traction work. Initial salary £500, but will consider any genuinely progressive offer.—Box 8601, c/o The Electrical Review.

A young Electrical Engineer with practical and sales experience, desires an outside position entailing the use of a car. Higher National Certificate, A.M.J.I.E., Stu.I.E.E., medical exempt, willing to go anywhere and do anything.—Box 8624, c/o The Electrical Review.

ADVERTISER, exp. invoicing, pricing, contract accounts, seeks position.—Box 8684, c/o The Electrical Review.

ADVERTISER, many years' experience manufacture leading H.R.C. fusegear, seeks similar executive post with light/medium electro-mechanical firm, Midlands or S. England.—Box 8688, c/o The Electrical Review.

A.M.I.C.E., with good experience of power, steam, gas and water, requires position in technical or maintenance capacity. Write—Box 8636, c/o The Electrical Review.

A.M.I.E.E. (29), public school, six years electrical officer Navy, maintenance, installation pre-war industrial motor drives, requires situation especially with small progressive firm. Own car. Capital available. Home Counties preferred.—Box 8698, c/o The Electrical Review.

ADVERTISER (42) seeks executive position with progressive firm, London area preferred. Previous experience includes design, manufacture, technical sales of electrical resistances, accessories, control gear; manager light elect. eng. works.—Box 8710, c/o The Electrical Review.

A.M.I.E.E., A.M.I.Mech.E. (30), Electrical Engineer, lieut.-col. in R.E.M.E., available Class A release May, requires permanent responsible situation with prospects. Has sound industrial training, proved organising and technical ability, excellent references. Salary £800.—Box 8643, c/o The Electrical Review.

A.M.I.E.E., B.Sc.(Eng.), 34, requires position as technical assistant, distribution. 17 years' experience in supply industry, with technical and estimating work for transmission and distribution; at present in responsible position controlling labour. Reply, stating salary proposed.—Box 8712, c/o The Electrical Review.

A.M.I.E.E. (49), at present holding responsible technical position in large manufacturing organization, desires new post, London area preferred. Any suitable post would be considered, even if it were not primarily one of electrotechnics. Personally and technically known in industry, widely in U.K. and further. Four-figure salary only considered.—Box 8644, c/o The Electrical Review.

B.Sc.(Eng.), A.M.I.E.E. (33), desires progressive position, London area preferred; 6 years as naval electrical officer; previous experience in control gear, metering equipment, installation specifications. Minimum salary £500.—Box 8595, c/o The Electrical Review.

BUYER, aged 41, requires change. First-class experience of material requirements for electrical and engineering trades. Used to large purchases.—Box 8679, c/o The Electrical Review.

CASHIER/Clerk, 20 yrs.' experience telecommunications and transmission contracts, wages, stores supervision and contract office control.—Box 8596, c/o The Electrical Review.

CHIEF Cashier (37), desires change; 14 years electrical industry, including large public undertaking and retail selling organisation. Wide experience cash transactions, including hire purchase, wages, accounts, administration, staff control.—Box 8725, c/o The Electrical Review.

CHIEF Electrical and Mechanical Designer, M.Sc., electric motors, generators, specialist f.h.p. motors, fans, household appliances, latest design, seeks adequate post in industry or with consulting engineers.—Box 8606, c/o The Electrical Review.

CHIEF Storekeeper, over 20 years' experience wholesale electrical trade, fully conversant with accessories and domestic appliances, etc., desires change.—Box 8598, c/o The Electrical Review.

CLASS "A" Release Man with electrical experience, seeks position as Trainee, where adaptability and keenness offer scope for advancement.—Box 8704, c/o The Electrical Review.

COMMERCIAL Electrical Engineer, experienced in preparation of specifications and estimates for all classes of electrical installations, six years with large supply company, 5½ years electrical officer Royal Navy. At present employed, but desires to improve position. Particularly interested in rural development and agricultural equipment.—Box 8694, c/o The Electrical Review.

DEPARTMENTAL Manager, 37, with 21 years' experience in the design and production of electrical equipment, control gear, accessories, etc., seeks appointment as assistant general manager, or similar executive position where organising ability and experience of modern production methods can be fully utilised.—Box 8720, c/o The Electrical Review.

DRAUGHTSMAN-Designer (36) seeks progressive position; 14 years' experience in design of supertension cable accessories; also L.T. and H.T. experience. —Box 8709, c/o The Electrical Review.

ELECTRIC Motor Control, Contactor and Switchgear Engineer requires progressive post.—Box 8609, c/o The Electrical Review.

ELECTRICAL Designer, D.C. and A.C. machines, 26 years' design experience.—Box 8622, c/o The Electrical Review.

ELECTRICAL Engineer, Grad.I.E.E., National Certificate with distinctions, at present Staff-Sgt. Armt. Art. Elect. R.E.M.E., age 26, used to handling men and accepting responsibility, pre-war training in manufacturing and repair organisation, desires progressive situation in U.K., designing, testing, or supervising manufacture and repair of electrical machines. Available May. Approx. salary £400 p.a.—Box 8724, c/o The Electrical Review.

ELECTRICAL Engineer, well qualified and experienced design, production, technical sales power and rectifier transformers, desires position of responsibility in Greater London area.—Box 8673, c/o The Electrical Review.

ELECTRICAL Designer, D.C. special, rather than A.C. standard.—Box 8723, c/o The Electrical Review.

ELECTRICAL Engineer requires responsible position of trust. Comprehensive experience of large industrial installations, H.T. and L.T. distribution systems, motors, etc., labour control and organising ability.—Box 8612, c/o The Electrical Review.

ELECTRICAL Engineer (24), Grad.I.E.E., desires progressive position. Public School education. Premium apprenticeship. Experience on all types of rotating electrical machinery, including design and cost investigation. Anything considered.—Box 8717, c/o The Electrical Review.

ELECT. Eng. (25), Grad.I.E.E., experienced production and design f.h.p. motors and transformers, aircraft electrical installation, laboratory and administration, desires responsible position.—Box 8696, c/o The Electrical Review.

ELECTRICAL Engineer (27), Nat. Cert. Elect. & Mech. Eng., indentured apprentice, R.E.M.E. officer, 6 years' service, free May, seeks post with prospects London area.—Box 8625, c/o The Electrical Review.

ELECTRICAL Engineer (34), B.Sc., prospective A.M.I.E.E., H.V. transmission line, small power station plant, experimental and research, control of labour, wants plant installation job with good concern. Experience more important than salary. Go anywhere. —Box 8714, c/o The Electrical Review.

ELECTRICAL Engineer (38), free now, requires position home or overseas. 20 years' practical and supervisory experience, supply and industrial, E.H.T., L.T. and D.C. generation, conversion, maintenance and installation, protection and control gear. Salary £500.—Box 8716, c/o The Electrical Review.

ELECT. Engineer (43), seeks executive post with progressive firm. 15 years' contracting, 10 years' London consulting experience on industrial and commercial schemes.—Box 8671, c/o The Electrical Review

ELECTRICAL Maintenance Engineer requires position. Experience A.C. and D.C. systems; 15 years' pre-war exp., now demobbed.—Box 8652, c/o The Electrical Review.

ELECTRICAL Manufacturers' Technical Representative, 25 years London and Home Counties, desires change for another group or firm. Rapidly increasing sales record proved. Remuneration adjusted according to terms on which car is provided, firm, or by me.—Ruislip 3529. 8658

ENGINEER, University graduate, 28, seeks position of responsibility in contracts or sales; London area; salary £500-£600.—Box 8659, c/o The Electrical Review.

ENGINEER, 51 yrs., seven years manager elec. contractors and five years consulting (all services) Air Ministry and M.A.P. Excellent contacts and can introduce business. Free, as present employer is closing down. Similar position with prospects required.—Box 8600, c/o The Electrical Review.

EXECUTIVE (43), life experience electrical and mechanical production, 12 yrs. managerial positions, including control purchasing, planning, costing, production, accounts, sales and advertising, good knowledge company procedure, seeks similar position. Free May. Minimum salary £1,000 p.a. London area preferred but not essential.—Box 142, c/o The Electrical Review.

EX-Elect. Lieut. R.N.V.R. seeks position abroad or U.K. as Sales Engineer or Representative. Technical and practical experience.—Box 8651, c/o The Electrical Review.

EX-R.A.F., Public School, desires change; conversant with installation requirements and electrical accessories, including domestic appliances. Knowledge of estimating and general office administration; wishes to work hard for promotion.—Box 8668, c/o The Electrical Review.

EX-R.N. Electrical Artificer seeks progressive employment in electrical fitting shop. Used to handling men. —Box 8686, c/o The Electrical Review.

FOREMAN Electrical Fitter (32), varied experience, at home and abroad, seeks appointment in company engaged on repair, manufacture or maintenance of electrical apparatus. Strict disciplinarian; preferably East London or Essex area.—Box 8627, c/o The Electrical Review.

FOREMAN Electrician seeks position, preferably with supply authority. Fully conversant installations, domestic appliances. Ex. refs.—Box 8653, c/o The Electrical Review.

LEAD Acid Accumulators. Advertiser, age 38, seeks executive position; 20 years' general experience with all types and modern methods.—Box 8618, c/o The Electrical Review.

LIEUT. (E.), R.N., A.M.I.E.E., D.F.H.(Hons.), 30, desires commercial/administrative appointment with good prospects. Steam, generation, switchgear experience. Immediately available.—Box 8707, c/o The Electrical Review.

OVERSEAS—Electrical Engineer (37), D.F.H., A.M.I.E.E., ex-R.A.F. technical officer, with home and overseas service, sound training and testing experience of heavy and medium rotating and static plant, switchgear and oil engines; 10 years' pre-war industrial experience in manufacture, design, installation, estimating and sales, accustomed to selection and buying of electrical components, requires responsible technical commercial or other position overseas.—Box 8715, c/o The Electrical Review.

PUBLIC Relations Officer, Development Officer (or similar appointment of responsibility). Advertiser having 20 years' comprehensive commercial experience of the electricity supply industry seeks appointment where his knowledge can be used to mutual advantage. Good appearance and approach, progressive mind, unimpeachable references. Commencing salary £360-£400 per annum. Would consider Dominions appointment.—Box 8602, c/o The Electrical Review.

REPRESENTATIVE, Technical, 10 years' experience London area, extensive connection, desires to represent manufacturer.—Box 8654, c/o The Electrical Review.

REPRESENTATIVE, well connected Midlands, desires to contact manufacturer of high-class Domestic Appliances. Salary or commission.—Box 8697, c/o The Electrical Review.

SALES Manager desires to meet manufacturers of lighting equipment.—Box 8655, c/o The Electrical Review.

SPECIALIST Design Engineer of lighting fittings (metal, glass and plastics), for Tungsten and Discharge Lamps, seeks central London post. £600 p.a. min.—Box 8632, c/o The Electrical Review.

YOUNG Electrical Engineer (26), Class A release from Fleet Air Arm, seeks position with prospects; 4 yrs.' pre-war commercial and technical schooling.—Box 8689, c/o The Electrical Review.

YOUNG man, age 26, 10 years' varied experience electrical instrument making, in laboratory, test-room, drawing office, etc., desires change, London area. Used to resistance, condenser, R.F. work. Preference for practical experimental work in development or similar.—Box 8695, c/o The Electrical Review.

YOUNG Man (24), militarily exempt, experienced, seeks a progressive technical assistant's position in a North London Company. A position on remote control research preferred; others considered.—Box 8722, c/o The Electrical Review.

YOUNG Technician (25), Nat. Cert. El. Eng., desires to improve drawing office experience. Has good practical and some drawing office experience.—Box 8693, c/o The Electrical Review.

FOR SALE

Traders buying and selling hereunder must observe the Restriction of Resale Order, S. R. & O. 1942 *No.* 958.

BRIERFIELD U.D.C. ELECTRICITY DEPARTMENT.

THE Council invite offers for the purchase and removal from site of the following:—

1 Motor Generator, consisting of 65 h.p., 3-phase, 400-volts, 50-cycles Motor, and direct coupled 40-kW. D.C. Generator, 220/240 v., complete with Oil Immersed Star/Delta Starter, of Messrs. George Ellison's manufacture. The Motor and Generator are of the English Electric Company's manufacture.

These machines are actually on load operation, and can be viewed under load conditions. Further particulars may be obtained from N. Ashton, A.M.I.E.E., Engineer and Manager, "Electricity House," Colne Road, Brierfield. Offers to be made in sealed envelopes, endorsed "Motor-Generator," and lodged with the undersigned not later than the 12th April, 1946. The Council do not bind themselves to accept the highest, or any offer.

H. L. SMITH,
Clerk to the Council.

Town Hall,
Brierfield, Lancs.
15th March, 1946. 105

LONDON POWER COMPANY LTD.

OFFERS are invited for: Two 12-kW Petters Diesel Generating Sets, belt-driven D.C., comprising 20-b.h.p. type TUS2, twin-cyl., vertical 2-stroke cycle Oil Engines, with 12-kW. 240-v. Generators, piping, air filters, etc. New condition. Installed 1939 for A.R.P. Only run since installation few minutes weekly test. May be inspected at Battersea Power Station, Kirtling St., S.W.8, by arrangement with Superintending Engineer (Phone, Mac. 1051).

Obsolete Boiler Spares, including C.I. parts for Oberhausen Gear (B. & W.), Coal Agitator (Taylor Stoker), Erith Roe Stokers, Bricks, etc., at Deptford West Generating Station. Full list may be had on application to—Stores Controller, Ergon House, Horseferry Rd. S.W.1. 182

BOROUGH OF LEIGH ELECTRICITY DEPT.

Sale of Plant.

OFFERS are invited for the purchase of the undermentioned equipment:—

GENERATOR.—1 steam driven, 500kW, 440/470 volts, Direct Current Generator, comprising: James Howden & Co. Double-Acting, Triple expansion 180 lbs. steam pressure, direct coupled to Bruce Peeble's 500-kW, 440/470 volts, D.C. Generator, 300/330 r.p.m.: Control Panel, 2 D.C. Whipp & Bourne D.C. Circuit Breakers.

DYNAMOS.—2 old Dynamos, 300 volt, 135 amps. by Mather & Platt.

METERS.—168 Ferranti and C. & H. D.C. Meters, from 2½ amps. to 100 amps.

The successful Tenderer will be required to provide his own labour and tackle for the removal of the plant. Further particulars, and permission to view, may be obtained from the Borough Electrical Engineer, Electricity Offices, Bradshawgate, Leigh, Lancs. Tenders, endorsed "Tender for Plant," are to be delivered to the undersigned not later than Tuesday, April 2nd, 1946.

ALBERT JONES,
Town Clerk.

Town Hall,
Leigh, Lancs. 104

ROYAL BOROUGH OF KINGSTON-UPON-THAMES

Sale of Surplus Equipment and Scrap Material

THE Electricity Department are prepared to receive offers for the purchase of the following plant, which is surplus to requirements.

1 3,000-kW Brush Ljungstrom 3,300-v., 50-cycle, 3-ph. Turbo-Alternator Set.

200-kVA and 100-kVA Oil-cooled Transformers, 3,300/415/240 v., 3-phase, 50 cycles.

3,300-v., 50-cycle, 3-phase Switchgear—sundry items.

440-v., 3-phase, 57-h.p. Motor, together with sundry other items.

The Turbo-Alternator may be seen in operation by appointment, and full details of the whole equipment and scrap material for disposal will be supplied on application to the Borough Electrical Engineer, 17, High Street, Kingston-upon-Thames.

A. W. FORSDIKE,
Town Clerk.

Guildhall,
Kingston-upon-Thames.
19th March, 1946. 164

A Monorail Electric Hoist with tot. enc. D.C. motors, 250 volt, and controllers by G.E.C., 7-ton cap., condition like new.—G.P.U. Ltd., Wembley, Middx. 197

A reliable Watertight Bakelite Lampholder, passed by the L.C.C. and fire authorities; used by the Admiralty and all municipal bodies. Needs no tools or screws. For use on 7/.029 T.T.R. cable. Known all over the world as the "Beeantee" Interchangeable Lampholder.—The Beeantee Illuminations (London) Ltd., 6, Upper Street, Islington, London, N.1. Tel. No. Canonbury 4555. 73

A.C. and D.C. House Service Meters, all sizes, quarterly and prepayment, reconditioned, guaranteed one year. Repairs and recalibrations.—The Victa Electrical Co., 47, Battersea High Street, S.W.11. Tel. Battersea 0780. 19

A.C. and D.C. Motors, all sizes, large stocks, fully guaranteed.—Milo Engineering Works, Milo Road, East Dulwich, S.E.22 (Forest Hill 2278-9) 8512

A.C. Motors, 1/75th h.p. to 10 h.p., all voltages. Also D.C.—The Johnson Engineering Co., 319, Kennington Road, London, S.E.11. Telephones, Reliance 1412/3. 57

ALL types of Transformers up to 15 kVA, including neon and fluorescent lighting chokes.—Woden Transformer Co. (Phone, Bilston 41959), Moxley Rd., Bilston, Staffs. 12

ALTERNATOR, 200 kVA, 250 r.p.m., 400/3/50, for coupling.—The Electroplant Co., Wembley. 196

ALTERNATORS: 400 volts, 3-phase, 50 cycles; 1-112 kVA Oerlikon 750 r.p.m.; 1-30 kVA. Slip Ring Induction Motors, 400/3/50: 3-100 h.p., 485 r.p.m. by Crompton; 2-67½ h.p., 720 r.p.m. by L. D. & C.; 2-40 h.p., 960 r.p.m. by Brush; 5-12 h.p., 960 r.p.m. by Brush; 4-12 h.p., 1450 r.p.m. by Hopkinson. Squirrel Cage Induction Motors, 400/3/50: 1-95 h.p., High Torque, 960 r.p.m. by Brush; 1-65 h.p., 960 r.p.m. by Newton; 1-50 h.p., 580 r.p.m. by Parkinson; 1-35 h.p., 1,460 r.p.m. by Brush; 1-35 h.p., T/Enc. 1460 r.p.m. by Brush; 1-17 h.p., 570 r.p.m. by L. D. & C.; 1-5/3 h.p., 1,450/735 r.p.m. by Brush; 12-¾ h.p., 1,450 r.p.m. by Hopkinson.—Oldfield Enginering Company Limited, 96, East Ordsall Lane, Salford, 5. 243

APPROXIMATELY 100 feet .1 square inch, 4-core, S.W.A.S. L.T. paper-insulated 660-volt J.P. Cable for sale.—Ive, 29, Clarendon Road, Watford. 8700

ATTRACTIVE Weekly Offers from the Electroplant Co., Wembley, Middlesex: (a) One 240/300-h.p. cold start 6-cyl. Diesel Engine by M.A.N., with coupled 135-kW. 480/240-v. Generator by E.E.C., all complete, can be seen running; (b) One 72-h.p. cold start 2-cyl. Diesel Engine by Petter, with coupled 46.5-kW. 3/50, 400-v. Alternator by G.E.C., 500 r.p.m., complete, new condition, can be seen running; (c) One Auto-synchronous Generating Set, 350 h.p., 400/3/50 Motor by Crompton-Parkinson, direct coupled 250-kW, 375-r.p.m., 230-v. D.C. Generator by Siemens, complete with Allen-West Gear. 198

BAKELITE Festoon Striplighting Holders for 7/.029 T.T.R. cable are now available for the coming celebrations. Write or 'phone—The Beeantee Illuminations (London) Ltd., 6, Upper Street, Islington, London, N.1. Telephone Number, Canonbury 4555. 72

CHARGING Plants, all sizes, immediately available from stock at 50% to 75% below retail prices. Space urgently required for manufacturing. Heavy Duty Models up to 75 volts at 12 amps.; smaller models for radio and small garage work up to 25 volts at 6 amps., all fitted moving coil meters. Standard Telephones and other reliable makes. Also in stock, Goodman Industrial Speakers. 6-watt model only, 50s. Industrial totally enclosed Electric Heaters, 35s. Large range of Amplifiers and P.A. Equipment, including Portable A.C./D.C. Dance Band and Guitar Amplifiers. Send for full list of equipment immediately available.—United Electronics Ltd., 156, North End Road, London, W.14. 129

CLEFA Hall Lanterns, Pendant Fittings and Wall Brackets. Also Shademakers' Gymbals, etc. Actual manufacturers.—Central London Engineering (Fabrications) Ltd., 120, Old Street, E.C.1. 87

COMPLETE Crude Oil Electric Generating Plant, 11.5 kW, 100/150 volts, 75 amps., 320 r.p.m. Comprising 22 h.p. crude oil engine with two water tanks 500 gallon storage tank, air compressor, etc. Engine direct coupled to Crompton generator with two panel generator and distribution switchboard, and 60 cell, 420 ampere hour capacity battery. Price on application. View by appointment.—Box 220, c/o The Electrical Review.

COMPLETE Power Station for sale in South Wales: 2 1,500-kW Westinghouse Turbo-Alternators, 200 lbs. pressure, 6,600/3/50, 3,000 r.p.m., with jet condensers and switchgear and auxiliaries; 1 3,000-kW Adamson/Siemens Turbo-Alternator, new 1941, 250 lbs. pressure, 3,000 r.p.m., with surface condenser, switchgear and auxiliaries; 1 3,750-kW Adamson/G.E.C. ditto; 1 Stirling Water Tube Boiler, 56,000 lbs. evaporation, 210 lbs. pressure; 2 Babcock & Wilcox Water Tube Boilers, 25,000 lbs. evaporation, each 210 lbs. pressure; 1 Thompson Water Tube Boiler, 25,000 lbs. evaporation, 200 lbs. pressure; 2 Thompson Water Tube Boilers, 12,500 lbs. each evaporation, 200 lbs. pressure; 2 30′ × 8′ 6″ Yates & Thom. Lancs. Boilers, 160 lbs. pressure; 4 30′ × 8′ 6″ Thompson Lancs. Boilers, 160 lbs. pressure, fitted with turbine furnaces; 1 30′ × 9′ Danks Lancs. Boiler, 180 lbs. pressure; 2 30′ × 8′ 6″ Danks Lancs. Boilers, 160 lbs. pressure; 2 9,000-g.p.h. Hall Feed Pumps, 200 lbs. pressure; 2 7,000-g.p.h. Weir ditto; 2 5,500-g.p.h. ditto; 2 4,000-g.p.h. ditto; 2 self-supporting Steel Chimneys, 10′ dia. × 90′ high; Induced and Forced Draught Fans, Elevators, Motors, etc. Further details on request from—B.C.S. (Engineers & Contractors) Ltd., Taffs Well, nr. Cardiff. Phone, Taffs Well 296. 4984

D.C. Generator, in excellent condition, made by English Electric Co., 20 kW, 230 v., 87 amps., 1,070 r.p.m., fitted with "V" rope drive.—J. Brooksbank, Son & Co. Ltd., Embsay Tannery, Skipton. 4879

ELECTRIC Motors and Dynamos. We hold one of the largest stocks of new and secondhand motors. Secondhand machines are thoroughly overhauled. Inspection and tests can be made at our works. For sale or hire. Send your enquiries to—Britannia Manufacturing Co. Ltd., 22-26, Britannia Walk, City Road, London, N.1 (Phone, 5512-3 Clerkenwell). 13

ELECTRICAL Appliances: Lighting, Cycle and Wireless Batteries, Electric Fires, Irons, Table Lamps, beautiful range of artistic and plain Lamp Shades, pendant, table and floor standard designs. Good deliveries in rotation. Write for new list. Customers are welcome to visit our Sample Showrooms.—Brooks & Bohm, Ltd., 90, Victoria Street, London, S.W.1. Phone, Victoria 9550. 61

ELECTRO-Medical Apparatus suitable for 250 volt, 50 cycle A.C., purchased new 1940. Total cost £140. Mercury Vapour Lamp, Sunic, with new element (Tip-Filt burner); Galvanic Battery, A.C. mains (Electro-Med. Supplies); Grosvenor (or L.W.I.R.R.) Generator (E.M.S.); Portable Thermoset Junior Diathemy (E.M.S.), scarcely used; 1 Radiant Heath Bath, with 6 lamps or joints; Indolar Stimulator (Stanley Cox), Faradic current.—Box 157, c/o The Electrical Review.

ELECTRIC Motors, etc. We supply all types and sizes, etc., of electrical machinery. Send your enquiries to—Bebe Engineering, 3, Retreat Close, Kenton, Middlesex. 8731

ENGINE-driven Generator, etc. 1 Lister Petrol/Paraffin Engine, 2½ h.p., 600 r.p.m., belt driven to Newton D.C. generator, 50/75 v., 18 amps., 1,580 r.p.m.; 26 Hart Lead Acid Cells, totally enclosed, 150-amp. hrs. capacity; 1 Charging Switchboard and Control Unit; 1 Heayberd A.C. to D.C. Rectifier Unit.—Oldfield Engineering Co. Ltd., 96, East Ordsall Lane, Salford, 5. 4648

FLUORESCENT Lighting Choke, 80 watt. Prompt attention to all enquiries. Quantities available.—J. G. Elliot, 32, Plaistow Avenue, Birmingham, 8. 8727

FOR disposal, several New Laurence Scott ½-h.p., 3-ph. Motors.—Lewis & Lewis, 77, Great Portland Street, London, W.1. 147

GEORGE Cohen, Sons & Co. Ltd. for guaranteed Electrical Plant, Motors, Generators, Switchgear, etc.—Wood Lane, London, W.12 (Telephone, Shepherds Bush 2070) and Stanningley, near Leeds (Telephone, Pudsey 2241). Established 1834. 27

GLOBELITE and Double Anchor Lighting and Wireless (Torch, Pocket Lamp, etc.) Batteries. Now superior peace-time quality only. All types fully guaranteed. Supplied for home trade and export. Distributors—Brooks & Bohm Ltd., 90, Victoria Street, London, S.W.1. Tel. Vic. 9550. 47

GLOBELITE and Double Anchor Electric Fires, superior quality only. Supplied for home trade and export. Distributors—Brooks & Bohm Ltd., 90, Victoria Street, London, S.W.1. Tel. Vic. 9550. 48

JUNCTION Electric Irons, superior design and quality, supplied with suitable stand. Also Junction Nickel-plated Torch Cases. Supplied for home trade and export. Distributors—Brooks & Bohm Ltd., 90, Victoria Street, London, S.W.1. Tel. Vic. 9550. 49

LARGE quantity of V.I.R., L.C., T.R.S. and Welding Cable for sale at competitive prices. Immediate delivery from stock.—Box 224, c/o The Electrical Review.

LESLIE Dixon & Co. for Dynamos, Motors, Switchgear, Chargers and Telephones.—214, Queenstown Road, Battersea, S.W.8. Telephone, MACaulay 2159. Nearest Rly. Sta.: Queen's Road, Battersea (S.R.). 18

MOTOR Alternator Set by General Electric Co., 22 h.p., 120 volt, D.C., ball bearing motor, coupled to 16kW, 400-volt, 3-phase, 50-cycle Alternator.—Britannia Manufacturing Co. Ltd., 22/26, Britannia Walk, London, N.1. 232

MOTOR Alternator Set, 110 volt, D.C. Motor, coupled to 17 kVA, 220-volt, 3-phase, 50-cycle Alternator.—Britannia Manufacturing Co. Ltd., 22/26, Britannia Walk, London, N.1. 233

MOTOR Generator Sets and Convertors, all sizes and voltages from ½ kW up to 500 kW in stock.—Britannia Manufacturing Co. Ltd., 22/26, Britannia Walk, City Road, London, N.1. Telephone, Clerkenwell 5512, 5513 & 5514. 28

NAMEPLATES, Engraving, Diesinking, Stencils, Steel Punches.—Stilwell & Sons Ltd., 152, Far Gosford Street, Coventry. 14

NUMBER of plating and anodysing generators for sale. 350 to 1,600 amps.—Fyfe, Wilson & Co. Ltd., Bishop's Stortford. 228

PETROL-driven Generating Set, output 18 kVA, 400/440 volts, 3 phase, 50 cycles, with exciter.—Fyfe, Wilson & Co. Ltd., Bishop's Stortford. 227

PETROL Electric Generating Sets, from 120 to 3 kW, new designs, good deliveries.—Arthur Lyon & Co. (Engs.) Ltd., Africa House, Kingsway, W.C.2. 70

PHONE 98 Staines. Weir Feed Pump, 8¼″ × 6″ × 18″; Weir Service Pump, 6,000 g.p.h.; 34-kW Browett Steam Set, 220 v. D.C.; 50-kW Hindley Steam Set, 440/220 v. D.C.; 3-throw Pump, 3¼″ × 6″, 700 lbs. pressure; 80-h.p. Petter Atomic Diesel; 35-kW Crude Oil Set, 220 v.—Harry H. Gardam & Co. Ltd., Staines. 60

REBUILT Motors and Generators. Long deliveries can often be avoided by purchasing rebuilt secondhand plant. We can redesign or replace surplus plant of any size. Send us your enquiries. Over 1,000 ratings actually in stock here.—Dynamo & Motor Repairs Ltd., Wembley Park, Middlesex (Telephone, Wembley 3121 (4 lines); also at Phœnix Works, Belgrave Terrace, Soho Road, Handsworth, Birmingham (Telephone, Northern 0898). 26

RECORD Minor Meggers, 500 v., new, £9 9s. 9d.—Robins Electrics, 222, West End Lane, N.W.6. 4921

ROTARY Converters in stock, all sizes; enquiries invited.—Universal Electrical, 221, City Road, London, E.C.1. 16

SEVERAL Telescopic Tower Ladders ready for essential work. Extensions, Trestles and Steps to order.—Shaftesbury Ladders Ltd., 453, Katherine Road, E.7. Grangewood 3363. 15

SPIRAL Elements for electric fires, boiling rings, and other appliances, supplied to order.—Electrothermal Engineering Ltd., 270, Neville Road, London, E.7. 54

STAFF Time Checking and Job Costing Time Recorders (all makes) for quick cash sale. Exceptional condition. Write — Box 528, Smiths, 100, Fleet Street, London, E.C.4. 31

STEAM-Electric Generator Set for Disposal, Belliss & Morcom patent self-lubricating, Compound steam engine, approx. 120 p.s.i., direct coupled to an English Electric Co. A.C. generator, 175 kVA, 3 phase, 50 cycle, 400 volts, on same bedplate, direct coupled to an English Electric Co. D.C. Exciter, 3.9 kW, all 428 r.p.m.; Worthington Simplex condenser, with steam-driven pump; steam piping, separator and boiler mounting valve; Electrical control panels, instruments, etc. Offers invited. The equipment is in excellent running order, and may be viewed by arrangement.—Measurement Ltd., Tameside Works, Dobcross, near Oldham. 215

STOCKS for Disposal. No coupons or permits required. 20 Steel Buildings suitable for factories, garages, warehouses, etc., 10t Timber Huts, all sizes; 50,000 ft. Tubular Scaffolding; 3,00C Army Blankets; 5,000 Light and Heavy Weight Mackintoshes; 3,000 gallons Hard Gloss Paint, all shades; 2,000 gallons Red Oxide and Battleship Grey; 50 Steel Lockers; 50 Filing Cabinets; 200 Canteen Tables, 500 Canteen Forms; 500 Hospital Bedsteads; 500 Mattresses; 100 tons Corrugated Sheets, galvanized and black; 1,000 Hurricane Lamps; 1,000 Elsan Closets. We also have in stock Trucks for all purposes; Chestnut and Chain Link Fencing; Concrete Mixers; Extension Ladders; Asbestos Sheets, flat and corrugated; Tarpaulins; Wheelbarrows with iron and sorbo wheels; Carpenters' Benches; Varnish; Scaffold Poles; Putlogs; Slow Combustion Stoves; Bituminous Paint; Industrial Gloves; Dust Sheets; Steps; Boiler Suits; Stirrup Pumps; Ground Sheets; Swabs; Herringbone Cloth, etc. Write for our Price List to—Cornford's, Central Works, Sudbury Circle, Sudbury, Wembley, Middlesex. Telephone, Arnold 4436 or Gladstone 3554. 4793

THE Beeantee Illuminations (London) Ltd., of 6, Upper Street, Islington, N.1 (Telephone, Canonbury 4555), invite your enquiries for our noted Bakelite Festoon Striplighting Holders; also our Straight-through and Crossway Connectors, Floodlights, Crowns and Animated Novelties made of metal. Large stocks of our No. 1 Holders, now available. 71

THREE 35-kVA Ruston Hornsby/Maudsley Diesel-driven Alternating Sets, radiator cooled, 230 volts, single-phase, 50 cycles, 1,000 r.p.m., complete with fuel tank, silencer and generator control panel, fitted with automatic voltage control. Modern machines in excellent condition.—Stewart Thomson & Sons (L'pool) Ltd., Gladstone Works, Fort Rd., Seaforth, Liverpool, 21. 43

TWO 20-kW, 120-v., D.C. Steam Turbo Sets and Panels; Kohler automatic Sets, 5 kW, 220 v., 800 and 1,500 w., 110 volts; Pelapone Set, 100/140 v., IIa and panel; 5-h.p. Petter Diesel Set, 200/220 v., A.C.; 5-h.p. Petter Diesel Engine; Deisel Alternator Sets, 400/3/50, 350 kW, 125 kVA, 50 kVA; Alternator, 200 kW, 400/3/50 and panel; Switchboards, lighting and charging types.—E. Binns, 156a, Falsgrave Rd., Scarborough. 8708

WATER Tube Boilers in stock. Two 25,000 lbs. evap., 250 lbs. W.P.; One 25,000 lbs. evap., 175 lbs. W.P.; Two 20,000 lbs. evap., 175 lbs. W.P.; Two 16,000 lbs. evap., 190 lbs. W.P.; One 12,000 lbs. evap., 200 lbs. W.P.; One 9/10,000 lbs. evap., 200 lbs. W.P. We install complete, including brickwork. Economisers, pumps, piping valves, generating sets and motors in stock. Please send us your enquiries; we can give immediate delivery.—Burford, Taylor & Co. Ltd., Boiler Specialists, Middlesbrough (Telephone, Middlesbrough 2622). 32

WE invite your enquiries for all types of Transformers up to 50 kVA. Send full details of your requirements to—The Nelson Engineering Co. Ltd., Netherfield Road, Nelson, Lancs. Tel. 1545/6. 4788

½" and Oval enamelled C.J. Conduit, 10/20,000 ft., slightly off colour, 55/- 1,000 ft. collected.—Reliance 1581. 8706

1 Parkinson Electric Motor, AC., 35 h.p., 725 r.p.m., 3-ph., 50 cycles, 400 v., 48 amps., complete with Ellison starter; 1 Brooks Motor, 50 h.p., 400 v., 50 cycles, 3-ph., 1,000 r.p.m., complete with Ellison starter; 1 B.T.H. Induction Motor, 50 h.p., 400 v., 50 cycles, 3-ph., 68 amps., 725 r.p.m., complete with starter; 1 Westinghouse, D.C. Motor, shunt wound, 11 h.p., 460 v., 760 r.p.m., with starter; 1 Phœnix D.C. Motor, 25 h.p., 900 r.p.m., 460 v., complete with starter. The above motors are all in good condition and guaranteed.—Wm. Sykes & Sons, 74, Bondgate, Darlington. 4972

3 15-h.p., 400/3/50, 1,000-r.p.m.; 1 20-h.p., 400/3/50, 1,000-r.p.m. Slip Ring Motors, with starters, complete, £200.—Scott, Electrical Engineer, Chard. 8592

17-h.p., 460-volt, 50-cycle, single-phase Slip Ring Motor, 1,000 r.p.m., complete with 9" × 12" pulley, slide rails, oil-immersed starter, condensers. Apply—Jackson, Dalton Street, West Hartlepool. 8690

50-kW Steam Set, Belliss-Morcom-Siemens Generator, 450 amp., 550 r.p.m., 110 v., excellent cond.—Greenhalgh Bros., Burtons Field Mill, Atherton (117). 218

50-kW, 220-volt, Diesel-driven Generating Set, consisting of 80-b.h.p. Allen 3-cylinder, vertical cold start Diesel Engine, new 1934, speed 400 r.p.m., and direct coupled to 50-kW, 220-volt compound interpole Allen Generator, mounted on combination baseplate, and complete with Switchboard.—Box 121, c/o The Electrical Review. 155

90-kW, 230-volts D.C. Generator, G.E.C., speed 560 r.p.m., 3 bearings, bedplate, slide rails, Reynolds chain drive, approx. 8 ft. centres, cut wheels, complete with oilproof case, control panel containing ammeter, voltmeter and circuit breaker. Best offer accepted. Can be seen in running order at—Messrs. John Southworth & Sons Ltd., Jubilee Mill, Clitheroe, Lancs. 155

125-h.p., 710-r.p.m. Slip Ring Motors, voltage 400, 3-phase, 50 cycles, by Crompton Parkinson, complete with electrical equipment, also by Crompton Parkinson. Condition as new. Offers invited.—Box 153, c/o The Electrical Review.

160-kVA Alternator, 400/3/50, 500 rev., Dick Kerr, 3 bearings, on bedplate. Excellent cond.—Greenhalgh Bros., Burtons Field Mill, Atherton (117). 219

175-kW Belliss & Morcom Electric Construction Steam Alternator Set, 400 volt, 3-phase, 50 cycles, Engine No. 7923, 175 lbs. sq. in. pressure, 30 lbs. sq. in. back pressure, 428 r.p.m., complete with Electric Construction Exciter. All in good condition, ready for immediate use. Can be seen running.—A. E. Hawley & Co. Ltd., Sketchley Dye Works, Hinckley. 138

200-h.p. D.C. Motor, compound wound, protected type, speed 490, continuous rating, manufactured B.T.H., recently overhauled and in sound running order.—Box 193, c/o The Electrical Review.

250-amp., 420-r.p.m., 420-volt D.C. Lancs. Dynamo Generator, direct coupled to Browett Lindley Steam Engine, complete with condenser.—T. Porter & Co. (Salford) Ltd., Salford. Pendleton 1591. 8611

250-kVA Alternator, 400 volts, 3-phase, 50 cycles, 750 revs., with direct-coupled exciter; also two 250-kW Rotary Converters, with transformers and switchgear, input 6,600 volts, 3-phase, 50 cycles, output 420/210 volts D.C.—Midland Counties Electrical Engineering Co. Ltd., Grice Street, Spon Lane, West Bromwich. 36

500 Electric Motors, Dynamos, Transformers, Converters, etc., etc., at low prices.—S. C. Bilsby, A.M.I.C.E., A.M.I.E.E., Crosswells Road, Langley, near Birmingham. Phone, Broadwell 1359. 21

965-amp., 110-v., 550-rev. Compd. Generator, three-bearing type, on bedplate. Excellent cond.—Greenhalgh Bros., Burtons Field Mill, Atherton (117). 217

ARTICLES WANTED

A 3-ton Grab for an overhead electric crane, complete with hoist and cross travel motors, supply 400 v., 3-ph., 50 periods.—Box 156, c/o The Electrical Review.

ACCUMULATOR Plates (old) and lead Peroxide; as actual smelters we pay top price. Also old storage batteries, transformers and whole installations purchased.—Elton, Levy & Co. Ltd., 18, St. Thomas Street, S.E.1. Hop 2825-6. 39

DIESEL Engine, about 150 h.p., 750 r.p.m., for coupling, or complete Diesel Alternating Set, 150/200 kW, 400/3/50. Full details to—Box 195, c/o The Electrical Review.

ENGINEERING Technical Books (new or secondhand) wanted in any quantity. Attractive cash offers. Call—Third floor, 356, Oxford Street, W.1, or "Stoneleigh," St. George's Avenue, Weybridge. 62

FOUR 15-h.p., 400-v., 3-phase, 50-cycle Squirrel Cage Totally Enclosed Motors, 720 r.p.m., or modern secondhand ones.—J. S. Ramsbottom & Co. Ltd., Keighley. 161

MERCURY (Quicksilver) wanted. Write for packing instructions. Gold, Silver and Platinum also purchased.—Collingridge & Co. Ltd., Riverside Works, Riverside Road, Watford (Tel. 5963). 20

ONE D.C. to A.C. Convertor, 50/60 kVA, 480 v. D.C. input, 400 v., 3-phase, 50 cycles output.—Box 237, c/o The Electrical Review.

REQUIRED, Automatic Coil Winding Machines for electrical coil winding.—Box 38, c/o The Electrical Review.

SMALL Lighting Plant wanted for small country house, about 2,000-w. load. Must be good condition.—Hague & McKenzie Ltd., Sloane St., Birmingham, 1. 8702

TRANSFORMER, 500 kVA, 11,000 volts, 3,300 secondary, 3-phase, 4-wire.—W. J. Simms Sons & Cooke Ltd., Plant Dept., Spring Close Works, Lenton, Nottingham. 8718

STEAM Piping for 260 lbs. sq. in., 760° F. working pressure wanted in good condition, 9" I.D. or near. Particulars to—Box 145, c/o The Electrical Review.

THREE 5/6-kW, 110-v. Steam Engine-driven Generating Sets, totally enclosed.—Box 4951, c/o The Electrical Review.

TWO 20-h.p. Motors, 400 volts, 3-phase, 50 cycles. Totally enclosed type preferred, complete with starters.—W. J. Simms Sons & Cooke Ltd., Plant Dept., Spring Close Works, Lenton, Nottingham. 8719

URGENTLY wanted: 2 Surface Condensing Plants to suit 2 1,500-kW Turbo Sets; 2 750-kVA or one 1,500-kVA Transformers, 6,600/3/50 to 440/3/50; 2 Oil-immersed Starters, 110 h.p., 440/3/50.—B.C.S. (Engineers & Contractors) Ltd., Taffs Well, nr. Cardiff. Phone 296. 4983

URGENTLY wanted, Diesel Alternating Set, 350 kW, 400/3/50, direct coupled, in first-class condition.—Box 194, c/o The Electrical Review.

USED Typewriters of all makes purchased. Phone or write—Remington Rand Ltd., Head Office, 1, New Oxford Street, London, W.C.1 (Chancery 8888). Branches in all principal cities. 188

WANTED, D.C. and A.C. ball-bearing Motors. Full details to—Britannia Manufacturing Co. Ltd., 22/26, Britannia Walk, London, N.1. 29

WANTED, Rotary Converters, any size.—Universal, 221, City Road, London, E.C.1. 22

WANTED, 5-h.p., 400 volts, 3-phase, 50-cycle, 750-r.p.m., squirrel cage Motors, up to 8 motors urgently required.—Box 231, c/o The Electrical Review.

WHOLESALE Exporters require continuous good supplies of Cycle Front Lamps of all types and good quality Torch Cases. Please send details to—Box 141, c/o The Electrical Review.

1 Spot Welder, 1 or 2 kVA, for 230 v., 1-ph., 50 cycles supply; 1 Transformer, 1 kVA, input 230 v., 1-ph., 50 cycles, output various tappings from 180-260 volts; 1 Ammeter, scale 0-1, and 1 Voltmeter, scale 0-300 or 150-300, both for A.C.—Box 8649, c/o The Electrical Review.

12/14-h.p. Diesel and 10/14-kVA, 230/1/50 Alternator. Would accept engine only.—Averys of Bristol Ltd. 8701

WORK WANTED AND OFFERED

A specialist firm requires Small Armature and Stator Winding work in quantity.—Max Electric Co. Ltd. (formerly Southern Ignition Co. Ltd.), 100, Thornton Rd., Croydon. Phone, Thornton Heath 4276-7-8. 59

ADVERTISERS desire to contact manufacturer capable of undertaking supply of Small Carbon Microphones, associated Transformers and Single Earphones suitable for incorporating into Hearing Aids.—Box 8692, c/o The Electrical Review.

ADVERTISERS have regular orders to place for Mild Steel Stampings for presses up to 100 tons, also for a large variety of other engineering work, Drop Forgings, Milling, Capstan Work, Grinding, Finishing, Salt Bath Hardening, etc. Please send details of capacity.—Box 8646, c/o The Electrical Review.

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CAPACITY available for high-speed Precision Turning on Swiss Automatics, ¾" dia. maximum. Rapid production and quotations by return.—Bristol Repetition Ltd., Wrington, Bristol. 88

COIL Winding!! H.F., Induction, Chokes and Relays. Capacity available up to 50,000 per week.—E. W. Engineering Co. Ltd., Nether St., N.3. Finchley 5974. 10

DRAWINGS and Tracings prepared by Designer-Draughtsman, general, electrical and radio engineering, assembly, details, schematics, wiring diagrams. Small and medium rotating electrical machines a speciality.—Box 8678, c/o The Electrical Review.

ELECTRICAL Meters of all types promptly repaired. Multi-range meters a speciality. Work guaranteed. Henri & Co., 97, Buckingham Palace Rd., S.W.1. Vic. 1455. 8705

ENGINEERS Precision, South England, seek manufacture of electrical, mechanical or domestic assemblies or components. Press tools, gauges, small stampings, capstan turning, also Internal and External Grinding. Write—Box 74, c/o The Electrical Review.

FRACTIONAL, horse-power motor specialists have capacity for repairs and quantity armature winding. First-class workmanship only.—C.S.S. Electrical Co. Ltd. (Reg. Office), 107, Collinwood Gdns., Ilford. 8713

MANUFACTURING Company, in Dorset, has immediate capacity for the manufacture, assembly and testing of domestic or industrial electrical equipment or components. Write in the first instance to—Box No. 209, Electrical Review, Dorset House, Stamford St., S.E.1.

MACHINING Work, for Centre Lathes up to 6½ in. centres and medium-sized milling (good grade work preferred.—The London Electric Firm, Croydon. Uplands 4871. 56

NORTH-East Lancashire Electrical and Mechanical Engineers invite enquiries from Principals and Agents for manufacture of small electrical or mechanical units.—Box 4738, c/o The Electrical Review.

REPULSION Induction Motors. A well-established firm of repute are prepared to place firm orders for continual delivery of ¾, ½ and 1-h.p. Repulsion Induction Motors in special design frame in quantity of about 500 motors per annum. A small firm will be given every assistance regarding production, etc. Write—J. Ambrose, 25, Chepstow Place, Bayswater, W 2. 115

VITREOUS Enamelling. Capacity is now available for vitreous enamelling Cooker Hobs, Linings, etc. Send your enquiries to—Enamellers (Ashton-under-Lyne) Ltd., Junction Mills, Whittington Street, Ashton-under-Lyne, Lancs. Telephone No. Ashton-under-Lyne 1767. 4977

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A Super Factor specialising in Motor Car Accessories and Garage Equipment, Electrical and Allied Trades, with wonderful connections home and abroad, wants sole distributorships, preferably British Isles.—Box 4988, c/o The Electrical Review.

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CABLES, Electric Lighting, Power and Vehicle Wiring. Immersion Heaters, Electric Fires, etc. Established wholesale distributing house, with centrally situated office in Belfast and six travellers covering Northern Ireland, anxious to contact reputable manufacturers of above lines with view to representations in Northern Ireland.—Box 1392, Eason's Advertising Service, Belfast. 4944

EIRE. Oldest established Wholesale Electrical Factors in Southern Ireland desirous of contacting manufacturers for sole selling rights, either commission or buying.—Roper Bros. Ltd., 5, South Anne Street, Dublin. 173

ELECTRICAL and Radio Engineer established in Brussels. Good connections wholesalers, seeks Agency for Belgium. Best references. Write to—F. F. Librairie Decock, 204, Rue de Ribeaucourt, Bruxelles. 242

EXPORT Company with excellent connections in Near East, wishing to increase range of commodities to include Textiles and Electrical Fittings and shortly sending principal to Turkey, Greece, Iraq, Syria, Egypt, would welcome enquiries from firms manufacturing these products and desirous extending export trade in countries mentioned. Reply—Box 251, c/o Pool's, Aldwych House, London, W.C.2. 162

MANCHESTER Agent with strong wholesale connections ensuring widest distribution desires Agencies for progressive manufacturers of clocks, blankets, domestic appliances.—Box 4774, c/o The Electrical Review.

MANUFACTURERS' Agents operating in London and South of England open for additional Agencies for Switchgear, Accessories, Appliances and any products suitable for distribution through wholesalers.—Box 76, c/o The Electrical Review.

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MANUFACTURERS' Agents, covering the whole of Great Britain and Colonies, are desirous of contacting manufacturers with a view to sole selling rights (either commission or buying), post-war arrangements considered.—Box 23, c/o The Electrical Review.

MESSRS. Cooper, Gonshaw & Co. Ltd., 3/5, Maddox Street, London, W.1 (Tel. Mayfair 7057), established agents specialising in Electrical Appliances and Accessories for industrial and domestic use, whose connections extend throughout Europe and Gt. Britain among retail and wholesale houses, are open to represent on a commission basis manufacturers whose products are of quality, design and competitive prices. They are also prepared to sponsor first-class lines—arrangement with manufacturers. 4955

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REQUIRED, for Australia, reliable Petrol and Electric-driven Lawn Mowers; also electric ironing, washing, dish washing and floor polishing machines. Agency representation desired. Reply—Box 185, c/o The Electrical Review.

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LONDON firm wish to act as London Office and collaborate with firm of engineers able to undertake manufacture domestic and general goods. Office, technical and design staff available. 2 rooms could be allocated entirely for use of principal. Established export trade is in full operation.—Box 236, c/o The Electrical Review.

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SYNCHRONIZING Systems for Facsimile Recorders. The proprietors of Letters Patent No. 541042, relating to the above matter are desirous of entering into negotiations for the sale of, or issue of licences under the patent. Enquiries to—Forrester, Ketley & Co., Chartered Patent Agents, 88-90, Chancery Lane, London, W.C.2. 238

THE proprietor of British Patent No. 499274, entitled "Carbon Electrodes for Electric Arc Lamps," offers same for licence or otherwise to ensure practical working in Great Britain. Inquiries to—Singer, Ehlert, Stern & Carlberg, Steger Buildings, Chicago 4, Illinois, U.S.A. 130

EDUCATIONAL NOTICES

ENGINEERING Careers and Qualifications. Both Government and industry have announced and emphasised that young men with technical knowledge and qualifications must receive every chance of rising to the highest posts within their capacity in post-war engineering and allied industry. Write to-day for "The Engineer's Guide to Success"—200 courses—free—which gives particulars of the first-class training supplied by the T.I.G.B. for the A.M.I.E.E., A.M.Inst.C.E., A.M.I.Mech.E., A.F.R.Ae.S., A.M.I.P.E., B.Sc.(Eng.), C. & G., etc., examinations in which T.I.G.B. home-study students have gained 44 first places and over 1,000 passes. The Guide covers careers in all branches, Electrical, Mechanical, Radio, Aeronautical, etc.—The Technical Institute of Great Britain, 35, Temple Bar House, London, E.C.4. 77

LATEST A.M.I.E.E. Results. In the recent examinations held by the Institution of Electrical Engineers 477 candidates sat who had taken B.I.E.T. courses. Of these 457 were successful in passing the examinations. We believe this record of 457 successes out of 477 entrants has never before been approached by any oral or correspondence tutorial organisation, and indicates the very high efficiency of the modern system of technical training which we have laid down. The B.I.E.T. tutorial organisation is waiting to assist you either with a short specialist course or complete training for a recognised examination. We have available a large full-time staff of instructors, while the efficiency of our extensive organisation is a byword among engineers. We guarantee—"No pass—no fee." May we send a copy of "Engineering Opportunities"? Containing a great deal of useful advice and detailed information on over 200 home-study courses and examinations, this handbook is of very real value to the ambitious engineer. Our highly informative handbook will be sent free and without obligation on request.—British Institute of Engineering Technology (established 1927—over 200,000 students), 12, Shakespeare House, 17, 18 & 19, Stratford Place, Oxford Street, London, W.1. 33

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ELECTRICAL Contractor, Midlands, retiring through health reasons. Stock, plant and tools at valuation, plus goodwill, £700.—Box 186, c/o The Electrical Review.

MISCELLANEOUS

FACTORY Extensions and New Factories erected complete. Plans and licence applications prepared, sites found. Consult—The Universal Housing Company Ltd., Rickmansworth. 55

MICA. Indian Exporters would appreciate enquiries through their representative in England. For present quotations write—Box 8599, c/o The Electrical Review.

RELAY Automatic Telephone Company's Benevolent Fund. Notice is hereby given that the Annual General Meeting of the above-named Fund will be held at 24, Southampton Buildings, Chancery Lane, W.C.2, at 1 p.m. on Wednesday, the 3rd of April, 1946, to receive the Annual Report and Statement of Accounts for the year ended 31st December, 1945.—L. E. Jones, Hon. Sec. 177

TRANSLATIONS, technical, German into English, by engineer, 16 years' experience.—Lord, Lea Cottage, New Road, Esher, Surrey. 8640

COMPANY MEETINGS

THE NORTHMET POWER COMPANY

Lord Ashfield's Speech at the Ordinary General Meeting, 19th March, 1946

AT the Ordinary General Meeting of The Northmet Power Company, held at Caxton Hall, Westminster, S.W.1, on Tuesday, 19th March, the Rt. Hon. Lord Ashfield, P.C., Chairman and Managing Director, said:

I have during the past few years at our Annual General Meetings referred to the many reports and memoranda which have been made and written upon the future of the electricity supply industry. I do not propose to add anything to-day, except to call your attention to a statement from the Incorporated Association of Electric Power Companies which has appeared recently in the Press announcing the determination of the Electricity Supply Companies to resist by every legitimate means the Government's declared intention of nationalizing the electric supply industry. It is considered that to bring electricity supply under State ownership is entirely opposed to the interests of taxpayers, consumers and employees.

We are well entitled to be proud of our war record, as the maintenance of the supply of electricity was, as you may well imagine, no easy matter, and it says much for the spirit of all members of our staff that we were able to maintain, despite enemy action, a supply for essential war purposes.

It is with great pleasure I am able to say that the Rt. Hon. William S. Morrison, M.C., K.C., M.P., has accepted an invitation to become a Director of the Company and its subsidiary companies.

The total operating revenue was over £5,413,000, an increase of more than £300,000. This revenue flows in the main from the sale of electricity, and it is very pleasing to observe that we reached a new record, as the total units sold amounted to 1,058 millions, an increase of 33 million units.

Operating expenses amounted to more than £4,589,000, an increase of £321,000. This increase is mainly occasioned by the additional cost of coal, materials and increased salaries and wages. The cost of coal itself provides an increase of approximately £152,000 over 1944, and you will perhaps better appreciate this increase when I tell you that coal prices for the last quarter of 1945 were almost double those paid in 1938.

Your Directors recommend the payment of a dividend of 9%, less tax, on the Ordinary Stock. With a dividend of 9% on the Ordinary Stock the overall return on the total capital expenditure of the Northmet Company and its subsidiary, the Station Company, is only 3.2%, which cannot be considered unduly high.

As regards our subsidiary company, the capital expenditure of the North Metropolitan Power Station Co. Ltd. during the year on extensions to the generating stations amounted to £74,438. After deducting the cost of plant written off, the total expenditure at 31st December, 1945, was £5,519,095.

"I suggest that we may therefore look to the future with confidence. Our power stations and distribution system are efficient and modern in all respects. We shall, in addition, continue our policy of expansion and development, not content until every habitation in our area has available an abundant and cheap supply of electricity.

The proceedings terminated with a vote of thanks to Lord Ashfield. 127

COMPANY MEETINGS—*continued.*

COUNTY OF LONDON ELECTRIC SUPPLY

Nationalisation and the Consumer

THE 52nd Ordinary General Meeting of The County of London Electric Supply Company Ltd. was held on 19th March in London.

Sir Robert Renwick, Bart., K.B.E. (the Chairman) said that the total receipts, at £8,308,000, showed an increase of some £410,000 Total costs, at £5,378,000, showed an increase of approximately £422,000, mainly accounted for by the increased cost of coal.

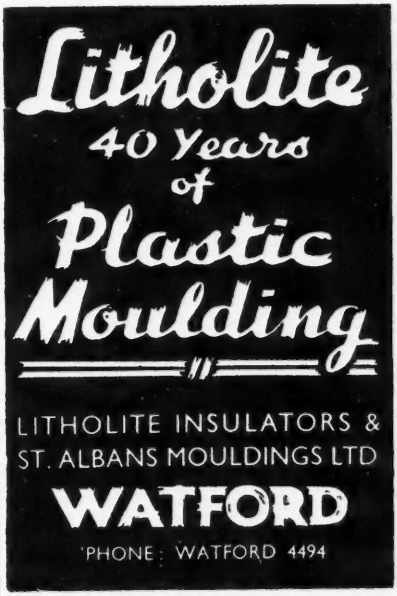
Dealing with the Government's proposals to nationalise a number of industries, including the electricity supply industry, the Chairman said that he wanted to say immediately that if and when their industry ever became nationalised, that day would be the last day on which ten million consumers of electricity in this country could expect cheaper electricity.

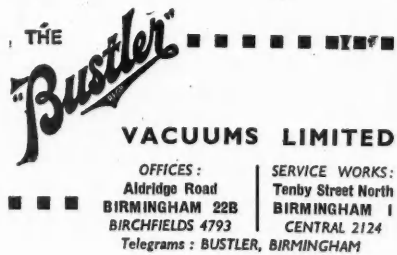
Under the Government's proposals for State ownership, it seemed that the consumer was always going to be wrong. It was becoming obvious from the progress of the Coal Nationalisation Bill in the House of Commons that the interest of the consumer was not the primary interest of the Government—indeed it was being completely disregarded.

If and when electricity was nationalised it would be the first prosperous and virile industry in the range of fuel and power which would come under State ownership, and losses incurred on coal and possibly gas would have to be made up from electricity. He claimed that the electricity supply industry was the best of any of the public services. There was no other industry in the country which, without Government assistance, had met all the demands made upon it during the war and increased its output for industrial purposes by over 90%. There was no other commodity in the country which was as cheap to-day as electricity under company and municipal ownership. The average revenue for the country for 1943-44 was 1.01d. per unit compared with 1.04d. per unit in 1938-39.

Dealing with the industry's "weak spots," he suggested the establishment of Area Committees, greater powers to the Commissioners, and control of dividends along lines already operating in the London Area. The Company's Board would oppose State ownership for their industry because they were convinced that State ownership was against the interests of the country, the consumers, the taxpayers, the employees of the industry and, though that was by no means certain, the shareholders.

The report was adopted. 154





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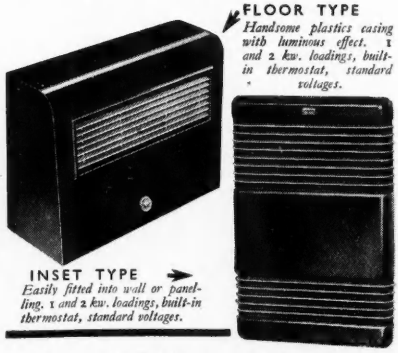

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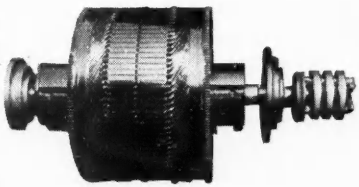

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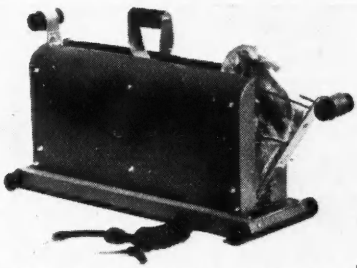

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